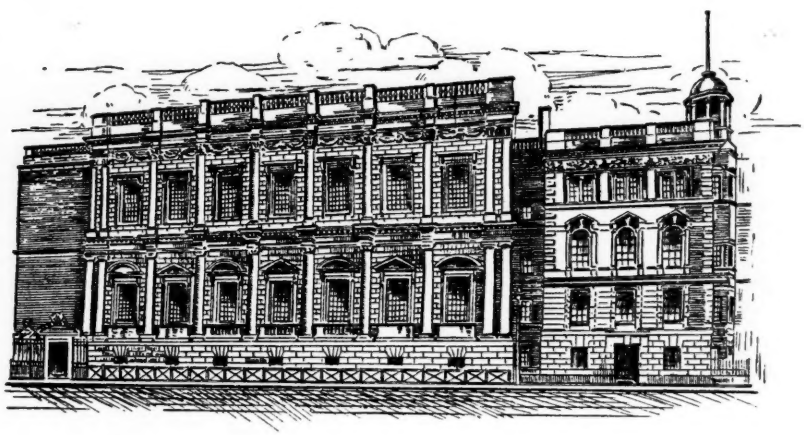
Published Quarterly

JOURNAL *of the* Royal United Service Institution.

Vol. LXXII, No. 488.—NOVEMBER, 1927.



PUBLISHED AT THE

Royal United Service Institution, Whitehall,

LONDON, S.W.1

Telegraphic Address: "RUSSATUS, PARL, LONDON."

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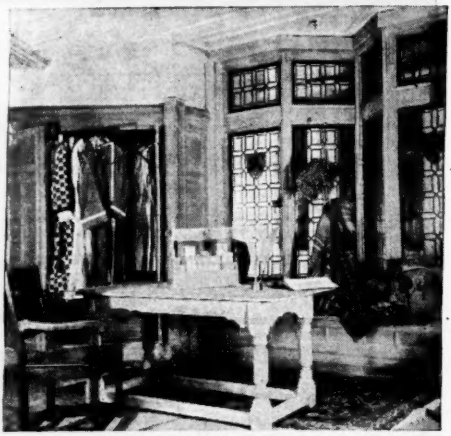

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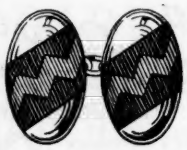

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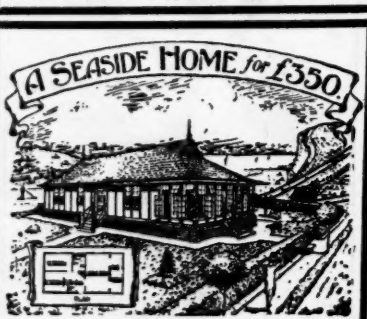

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1899. Commander G. A. Ballard, R.N.
1900. No Medal awarded.
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1907. Lieut.-Colonel A. F. Mockler-Ferryman, Reserve of Officers.
1908. Major A. B. N. Churchill, R.G.A.
1909. No Medal awarded.
1910. Captain P. W. Game, R.H.A.
1911. Captain H. T. Russell, late R.G.A.
1912. Commander K. G. B. Dewar, R.N.
1913. Major A. Lawson, 2nd Drags.
1914-15-16-17. No Medals awarded.
1918. Lieutenant W. S. R. King-Hall, R.N.
1919. Colonel J. F. C. Fuller, D.S.O., Oxford & Bucks L.I.
1920. No Medal awarded.
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1924. Major L. I. Cowper, O.B.E., King's Own Royal Regiment.
1925. Lieut.-Colonel J. C. Dundas, D.S.O., Royal Tank Corps.
1926. No Medal awarded.

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1900. Captain A. T. Mahan, United States Navy.
1907. Major-General Sir J. F. Maurice, K.C.B., p.s.c.
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SECRETARY'S NOTES

November, 1927.

INSTITUTION.

Council.

Major-General C. Bonham Carter, C.B., C.M.G., D.S.O., Director of Staff Duties, has been nominated by the Army Council as their representative on the Council of the Institution in the place of Major-General A. R. Cameron, C.B., C.M.G., who has left that office to take up the appointment of G.O.C.-in-C., Fourth Division.

New Members.

The following Officers joined the Institution during the months of August, September and October :—

Navy.

Lieutenant-Commander R. M. Alleyne, R.N.
Lieutenant-Commander S. E. Norfolk, R.N.
Captain H. T. England, R.N.

Army.

Lieutenant-General Sir Webb Gillman, K.C.B., K.C.M.G., D.S.O., late R.A.
Major H. S. Brown, D.S.O., M.C., Royal Artillery.
Lieutenant-Colonel E. A. Ewart, late Royal Artillery.
Lieutenant B. C. H. Whicker, Somerset Light Infantry.
Captain T. V. Williams, M.C., Duke of Cornwall's Light Infantry.
Captain A. R. Bare, D.S.O., M.C., Loyal Regiment.
Lieutenant E. P. N. Jones, M.C., Royal Horse Artillery.
Lieutenant W. J. Colyer, Royal Artillery.
Captain H. H. Lanyon, 4th King's Shropshire Light Infantry (T.A.).
Captain C. B. Lewis, Indian Army.
Lieutenant M. R. D. Pannett, The Devonshire Regiment.
Lieutenant W. A. Scott, M.B.E., Royal Corps of Signals.
Lieutenant G. W. Preston, Royal Engineers.
Lieutenant E. S. Master, King's Own Yorkshire Light Infantry.
Lieutenant S. A. F. S. Egerton, Highland Light Infantry.
Captain P. J. Fitzpatrick, A.M., D.C.M., Royal Engineers (Indian Army).
Captain G. N. Burden, Indian Army (retired).
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Lieutenant S. A. H. Kirkby, M.C., Royal Sussex Regiment.

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Lieutenant-Colonel R. T. G. Tangye, O.B.E., British Army of the Rhine.
Captain W. A. Bosworth, Sherwood Foresters.
Captain J. A. Prescott, Grenadier Guards.
Captain W. H. Langran, M.C., West Yorkshire Regiment.
Captain A. A. Richardson, Royal Artillery.
Captain E. C. Kensington, Royal Artillery.
Lieutenant-Colonel N. W. Stead, M.C., T.D., 4th Green Howards.
Captain J. M. Benoy, South Staffordshire Regiment.
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Captain R. N. Hales, Royal Artillery.
Lieutenant C. G. Stainer, Royal Engineers.
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Lieutenant R. H. A. Lucas, Royal Artillery.
Captain D. M. Anderson, late 8th Hussars.
Captain J. C. A. Birch, Bedfordshire & Hertfordshire Regiment.
Captain D. J. Stewart, York and Lancaster Regiment.
Major-General C. W. Gwynn, C.B., C.M.G., D.S.O., late R.E.
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Lieutenant S. J. Edwards, Bedfordshire & Hertfordshire Regiment.
Captain K. F. W. Thomas, The Kumaon Rifles.
Lieutenant A. V. Dufton, Reserve of Officers, late Intelligence Corps.
Captain J. Brookman, 2/20th Burma Rifles.

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Flight-Lieutenant A. Macgregor, D.F.C., Royal Air Force.
Flight-Lieutenant G. M. Knocker, Royal Air Force.
Flight-Lieutenant J. B. H. Rogers, Royal Air Force.

Members joining before the end of the year:

Present Members are asked to draw the attention of potential Members to the fact that by joining now they are not called upon for any further subscription until January, 1929, and that they are also entitled to the current number of the JOURNAL.

Programme of Lectures.

Cards of the lecture fixtures for 1927-28 have now been circulated. Any Member who has not received his card is requested to notify the Secretary.

Expulsion of a Member.

The Council has expelled Mr. A. N. A. Pinhey from Membership of the Institution under Bye Law No. 13, Chapter III.

They have also dispensed with Mr. Pinhey's services as Assistant Secretary and Accountant.

Office of Assistant Secretary and Accountant.

The Council have decided to defer making any appointment to the post of Assistant Secretary for the time being. The matter will be re-considered in the early part of next year. They have appointed Miss E. G. Bickell to the office of Accountant.

Additional Officer of the Institution.

Lieutenant-Colonel H. G. de Watteville, C.B.E., R.A. (R. of O.), Assistant Editor, has been enrolled as one of the officers of the Institution.

Gold Medal Essay, Military, 1927.

The following Essays have been received up to the 31st October :—

(1) " Experimentum Crucis."
(2) " Fore-see, Fore-warn, Fore-arm, Forward."
(3) " Regions Cæsar never knew, Thy posterity shall sway."
(4) " Doubtless it is true that before the commencement of a campaign, an army possesses in itself the causes of its future victory or defeat."

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A limited number of copies of the following coloured frontispieces, published in recent numbers of the JOURNAL, are available for sale and can be supplied, post free, for 1s. 6d. each ; 2s. 6d. a pair ; 3s. 6d. for three, or 5s. the complete set :—

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Key-Diagram to ditto.
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Louisburg.

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A few remaining copies in pamphlet form of most of the more recent lectures are available and can be supplied to Members for 6d. each, post free.

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The price of the JOURNAL to Non-Members, as from February, 1927, number, is 7s. 6d., or the four quarterly numbers will be sent for an annual subscription of £1 10s. 0d. ; post free in either case.

Trade Discount.

Recognised Firms can now be supplied with not less than one dozen copies of the JOURNAL at a time, at a wholesale price of 7s. 0d. each copy, the buyer to collect from the Institution.

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The special attention of those Members who are now paying the new annual subscription of £1 5s. od., is invited to the fact that they are thereby entitled to the full privileges of the Lending Library without further charge. These include the right to have sent to them not more than four volumes at a time on loan, the Member paying postage both ways.

Old Members who have not wished to conform to the new arrangement and who are still paying the original subscription of £1 1s. od., must pay an additional subscription of 10s. per annum in order to belong to the Lending Library.

All Members are, of course, free to use the Library when they visit the Institution.

MUSEUM.

Ship Model Exhibition.

The special Exhibition of pictorial models illustrating the development of warships from the ancient Briton's war-canoe to H.M.S. " Hood " is now installed in the crypt of the Museum.

Aircraft Model Exhibition.

An exhibition of models showing the development of aircraft is being arranged and, it is hoped, will be ready in January.

Additions.

(7946) A line engraving of Trooper Thomas Brown (of Kirkleatham in Yorkshire), of Bland's Dragoon Guards.—Given by Miss Brett.

(7947) An Officer's sword which formerly belonged to an officer of the 9th Foot who was killed in the Crimea.—Given by Mrs. S. D. Massy.

(7948) A coloured print " Left Shoulders Forward," of about 1820 period.—Purchased.

(7949) Presentation sword, hilt and scabbard of gold, and richly jewelled, which was given to the late General Sir James Willcocks, G.C.B., G.C.M.G., K.C.S.I., D.S.O., Colonel of the Loyal Regiment.—Bequeathed by the late General Sir James Willcocks.

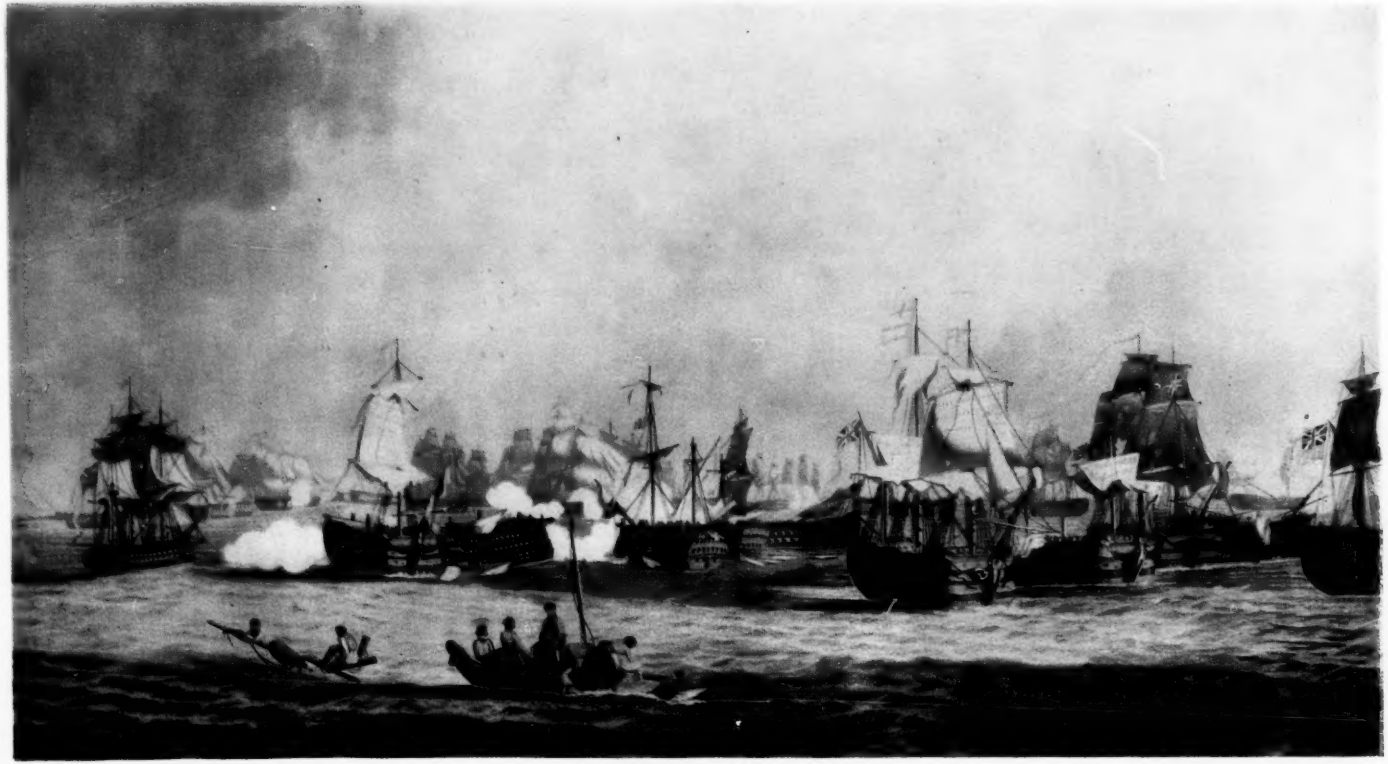
Attendance.

The amount taken for admission to the Museum during the past quarter was :—

£200 0s. 0d. in August.
£191 3s. 6d. in September.
£163 19s. 0d. in October.

Purchase Fund.

This Fund was opened with the object of purchasing suitable exhibits, which from time to time are offered to the Museum, or are put up for sale at various auctions. The Council hope it will receive support from Members of the Institution who are interested in the Museum.



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THE JOURNAL

OF THE

Royal United Service Institution

Vol. LXXII. NOVEMBER, 1927. No. 488.

[Authors alone are responsible for the contents of their respective Papers. All communications (except those for perusal by the Editor only) should be addressed to the Secretary, Royal United Service Institution.]

THE ROYAL NAVAL RESERVE AND ITS FUTURE

By CAPTAIN SIR DAVID WILSON BARKER, Knt., R.D., R.N.R., F.R.S.Edin.

On Wednesday, 23rd March, 1927, at 3 p.m.

VICE-ADMIRAL SIR LEWIS CLINTON-BAKER, K.C.B., K.C.V.O., C.B.E., in the Chair.

THE CHAIRMAN in introducing the lecturer, said: "Sir David Wilson Barker is well known to many members of this Institution as being the R.N.R. representative on the Council, and for that reason he has been asked to deliver this lecture, which I have no doubt will be one of very great interest. I do not think he will mind if I refer to him as being the father of the Royal Naval Reserve. He has had a very distinguished career, and for twenty-seven years was the Captain-Superintendent of that very excellent establishment, the training ship "Worcester," which has sent so many officers into the Mercantile Marine."

LECTURE.

IN preparing a paper on the Royal Naval Reserve, I have had in view principally the discussion which I hope may follow it, as the subject is one of great interest to all connected with the Royal Navy, the Mercantile Marine and the R.N.R. itself, and, though not every sailor will

bring forward his own particular ideas in public, a good number will, I hope, be willing to offer helpful constructive criticism after such a paper as this. My long connection with the R.N.R. and the fact that some 800 Naval Reserve Officers, trained under my command on board the "Worcester," served in the war, gives me some authority, I venture to think, to speak on the subject.

My predecessor on the Council of this Institution and late friend, Captain Caborne, C.B., R.D., R.N.R., devoted himself to the betterment of the Force, as his papers in the JOURNAL testify. No man, I think, ever worked harder to further the interests of the Naval Reserve and to encourage its development in the public interest. Since then, Mr. Frank Bowen, a well-known writer on nautical matters, has brought out a very comprehensive work on the Naval Reserve which covers its foundation and progress up to the present time. He has shown how it had to fight with vested interests and authorities to attain any sort of status. The Great War clearly demonstrated the enormous value of the R.N.R. which supplied not only numbers of men but many with special experience and qualifications, which proved of great value to the Regular Forces.

Herein, I may point out, lies its essential difference to other volunteer forces. The Naval Reserve came into the war trained to the sea, the element on which it had to fight. This qualification gives the R.N.R. the special right to be regarded as a *Regular Volunteer Force.* The Naval Reserve officer is constantly at sea, he rarely has a long spell on shore, and this in itself makes his "sea sense" a second nature. Nowadays, when the personnel of the Navy is so much reduced it is important that we should have such a Reserve—thoroughly fit and capable, when called up, to take its place immediately as efficient crews of warships. Nevertheless, the Mercantile Marine of the country must be kept going, and sufficient personnel retained for that work.

Enemy submarines were a terrible menace to our merchant shipping in the war, and now air power and poison gas are added dangers. It would almost seem as if our seaborne trade could scarcely survive the combined attacks of these forces. This emphasizes the necessity of training R.N.R. officers and men in the very latest methods of defence against these new means of destruction; while attention should be paid to means of protecting the ships themselves. In spite of food rationing during the war, I think most people still fail to realize that the life of this country depends entirely upon food imports, and that, in 1917, we were in dire peril of being cut off from supplies. I make no excuse for reiterating this fact, which I think needs emphasizing repeatedly in order to bring it home to the "man in the street." Admiral Lord Jellicoe put the position plainly, when he wrote:—

> "Our sea communications are our very life-blood and it is not exaggerating the case to say that the safety of these communications is the one consideration of first class importance

Upon a solid sense of their security depends not only our prosperity but also the actual lives of a large proportion of the inhabitants."

The Dominions and Colonies should all be made to realize the great necessity there is for forming effective volunteer associations to co-operate with the Navy. Australia has quite a good Naval Reserve and seems to do all she can to foster the Service: a powerful Navy may become as important to Australia as to England. Canada has a small Naval Reserve. In connection with this subject, we may notice the temporary fillip given to a volunteer naval reserve at the time of the "Trent" affair with the U.S.A., in the Civil War between the North and the South. The appreciation of this fact in early days led the wise seamen to advise the retention of such places as Gibraltar, Falkland Islands, Bermuda, among others, and lately to the selection of Singapore for the use of the Navy. Again, the possibility that it might be considered desirable in the interests of the Commonwealth to shift its centre from London to, say, Quebec must be kept in mind.

There is often a good deal of confusion in the minds of the general public as to the difference between the R.N.R. and the R.N.V.R. The R.N.R. is a *regular* volunteer force recruited from the Mercantile Marine, etc., ready for immediate service afloat. It is essentially a "deep sea" service. The R.N.V.R. is recruited from all sorts of professional landsmen and yachtsmen who are trained in various land establishments and go to sea at intervals for a course of instruction. Many of them are experienced in yachts and small craft and have special knowledge of our harbours and coasts. These qualifications, with the ability possessed by some of their personnel to handle small swift motor boats makes the R.N.V.R. a particularly valuable organization for local sea defence.

System of Entry.

While the system of entry appears satisfactory, it might, I think, be improved in the case of deck officers by demanding that they should fulfil more strictly the conditions laid down for candidates from the Training Ships. This would ensure that a candidate is in every case a fit and proper person for entry and for the position of an officer; the authorities in these ships have of course exceptional opportunities for recommending suitable candidates.

The experience of the R.N.R. Engineers has been similar to that of deck officers in failing to receive full recognition as a valuable and useful body of men. This is strange, as the Royal Navy Engineers themselves have been constantly fighting for more recognition. Happily much of this feeling passed away in the late war, and as in the case of the deck officers, a better understanding was established, to the advantage of the Naval Service generally. Unfortunately, cleavage is again apparent in both cases and the difficulty is to know how to stop it. I

am of course quite aware of the high scientific education of the Naval Engineer and of the extremely complicated mechanical conditions in a warship, but the same remarks apply to the cases of the R.N.R. Deck Officers in connection with co-operation in war.

The advantage of retaining Paymasters on the strength of the R.N.R. during peace time is not very evident, and I think this part of the force, with the exception of the Registrars, might be dispensed with, and the money so saved might be devoted to the Deck Department.

In March, 1914, the First Lord of the Admiralty stated that a wireless branch of the R.N.R. was to be started. So far, nothing has been done in that direction, and a good thing too! It was a grave mistake to set up such a body in sea-going merchant ships. In the old days, we should have classed them as "idlers." All deck officers should be trained in a knowledge of wireless, which would increase their usefulness on board ship, especially as signalling by means of wireless will probably supersede all other forms of communication between vessels, and all officers should be thoroughly conversant with this method.

As was demonstrated in the Great War, fishermen are a valuable branch of the R.N.R. Their special skill in trawling and dredging was particularly useful. They are, however, a very individualistic and conservative body of men and should be kept as much as possible in the vessels they are used to and also with the shipmates with whom they are accustomed to work. Trawlers, dredgers and such-like craft are not easy to work and need specially experienced men to handle them to the best advantage. The training of these men should be carried on during periods when the particular fishery in which they are engaged is slack. For instance, although trawling goes on practically all the year round, the herring fishery has slack periods. As certain ports lay themselves out for particular fisheries, might it not be possible to carry through courses of drill in these places?[1]

Training.

When studying the very full curriculum of drills and courses of instruction now arranged for the R.N.R. officers, my mind goes back to my first drill, in 1873, when we were exercised in truck guns, and, as a special advanced instruction, in 6-inch seven-ton muzzle-loading guns with mechanical training. Cutlass drill was also a great feature of the exercises, and ability to cut through bars of lead hung up by a yarn counted for much. We youngsters were much impressed by the skill of the instructor in this trick; we also were given to understand that he could cut a sheep in two at one stroke. On looking through the curriculum of the existing five comprehensive courses—a curriculum much improved since the war—one wonders if the improving process has not been overdone. Courses of navigation and pilotage have been

[1] It should be noted that the number of fishermen is declining.

deleted and signals curtailed; in these subjects, however, I venture to think the R.N.R. officer is better trained than the naval officer and, certainly, he has more experience at sea. R.N.R. instruction has always been rather full of detail, most of it quite unnecessary for the practical understanding of the work to be done. Courses of drill and instruction are constantly varying in detail; the latter puts a great strain on the memory while it is not particularly useful, especially to officers who have only a limited time for their drills.

I have always felt that the entry of young men into warships as probationary Midshipmen R.N.R. is not the best possible arrangement. I should prefer their taking the sea-course when they have obtained a Second Mate's Certificate and could be appointed as Acting Sub-Lieutenants R.N.R. (Probationary); also, instead of being placed on board a big ship with a lot of officers, they should serve all their time in smaller vessels, in which they would have a chance of becoming familiar with the method of handling men. By then, these officers would also be at a better age to appreciate what goes on around them. There is always the risk that a youngster serving some time in the Royal Navy will acquire habits which, while quite in keeping with naval discipline and style of living, might be unsettling to him in the rougher life of the Mercantile Marine. Again, the work as a Sub-Lieutenant in smaller vessels is likely to be of great use to the young R.N.R. officer in more ways than one. To begin with, it will assist him to acquire the habit of quick decision at an early period in his career. This, I think, would react on the Mercantile Marine to the advantage of both Services. Then, a valuable part of his training as a navigator would be the different aspects of the sea and horizon from the low freeboard of a destroyer or submarine, as compared with that from the lofty bridge of a merchant vessel. This eye training and also the development of the faculty of judging distances at sea have been greatly neglected and should form part of the education of all seamen in all branches; it is specially important in quick moving vessels. There might of course be some difficulty in keeping a Midshipman so long on probation and also of giving him the necessary elementary instruction in drills, etc., but I think in the end the course I venture to suggest would be the most advantageous.

While the majority of officers will no doubt take the general course of study, there are sure to be some who will have a predilection for a special branch, such as gunnery, electrical work, air work, etc. Such men should be noted and encouraged to take up whatever branch for which they appear to have special aptitude. Then again, there are men who come from Cable ships. These have exceptional knowledge of submarine work generally, of deep-sea sounding, the laying down of buoys, etc.; they too, might, with advantage, be placed where their specialist qualifications could be utilized to the best purpose. To illustrate this point, I may mention the work of Commander F. W. Robinson,

R.D., R.N.R., in the cable ship "Dacia," in cutting and diverting cables in the Atlantic under great difficulties.

A Naval Air Reserve.

Apparently nothing has yet been done to encourage R.N.R. officers to take up air work though many of them must be very suitable for such duty. With their expert knowledge of ships and marine objects generally they should prove particularly valuable as Observers. I think it is well known that, in flying over the sea, sailors have a great pull over landsmen. I think I am right in saying it is more difficult for an overland flyer to adapt himself to sea routes than it is for a sea-flyer to carry on overland. On completion of their flying career, R.N.R. officers might pass to the anti-aircraft section. The danger from aircraft and submarines to the Mercantile Marine in the future will be very great and it is essential that there should be a reserve of R.N.R. officers and men available for work with naval aeroplanes, seaplanes, flying boats and air-ships. The time is probably not far distant when an aeroplane will be part of the equipment of most liners, and already the importance to the seamen of "air sense" is second only to that of "sea sense." In the next war merchant vessels will have to carry anti-aircraft guns as well as anti-submarine weapons and it will be necessary to have trained officers and men to control the fire of these weapons as part of the ship's complements.

Smoke Screens, Convoy Work and Camouflage.

Camouflaged ships are nothing new, they date from early Norman times and students may take valuable hints in camouflage and smoke screens from animal life. Camouflage, smoke screens and convoy work are likely to be very important in any war. There seems no reason why merchant ships should not carry smoke screens as well as paravanes, as they might be very useful. Instruction in convoy work and zig-zagging is of great importance.

I do not know if a careful study has ever been made of the devices of breaking blockade or of the defence of a merchant ship. There are endless illustrations of both these interesting points. Cases of breaking blockade have been dealt with by French writers on the wars of the early XIXth Century and by American writers on their Civil war. History is full of gallant actions fought by merchant ships, even against war ships, and I need make no apology for bringing forward such cases in the late war as that of the fight made by Captain Parslow of the s.s. "Anglo California"; the action of Captain Bisset Smith[1] of the "Otaki," who went down in his ship fighting the gun to the last moment after nearly knocking out the German armed vessel "Moewe"; of Captain J. W. Bell of the "Thordis"; Captain Oliver of the "Clan McTavish," and Skipper Wall of the trawler "Gowan Lea"; to mention only a few

[1] Temporary Lieutenant, R.N.R.

gallant actions fought by men with no naval training but equipped just with their own courage and common sense and the support of their loyal crews.

In this connection, I think a grave injustice was done to some R.N.R. officers in the late war. When a merchant ship was taken over as a cruiser, the Master—generally a Commander or Lieutenant-Commander, R.N.R.—was relegated to a secondary or even lower position on board his own ship, a naval officer being appointed to command. The whole of our history, including such cases as I have mentioned above, shows clearly that a merchant Captain is quite competent to fight his ship. He may not be quite conversant with the Admiralty rules of war, but that matters nothing if he sinks the enemy.

Calling Up Reserve.

"On the order for mobilization, the Registrar-General of Shipping and Seamen directs R.N.R. Officers, up to the number required by the Admiral Commanding Reserves, to report themselves immediately at the Naval Depots, and, through the Registrars at the Mercantile Shipping Offices, calls up the Royal Naval Reserve ratings."

Tables at the end of this lecture give some details of the Naval Reserves including particulars relating to their mobilization and expansion in the late war. The fact that within forty-eight hours of its outbreak some fifty per cent. of the R.N.R. officers and men had responded to the call[1] speaks well for the perfection of the mobilization arrangements carried out by Mr. C. H Jones, C.B.E., Registrar-General of Shipping and Seamen. Paymaster-Commander Blake Harrold, R.N.R., O.B.E., succeeded Mr. C. H. Jones as Registrar-General. He has steadily developed and modernised the organization of his office.

The absorption of large numbers of Royal Naval Reserve officers and men for naval duties in war time placed a strain on the Mercantile Marine; man power cannot be replaced at sea in a short time by entries from outside as is the case in land industries. Fortunately the senior Officers of the Reserve in command of merchant vessels were, wisely, left to their normal jobs and they were able to render far more valuable service in conducting the trade of the country than they would have if they had been appointed to war ships. There is no doubt that the most useful recruits for the Navy in time of war are the Lieutenant-Commanders, Lieutenants and Sub-Lieutenants R.N.R. I have suggested[2] that on the outbreak of war all the Mercantile Marine should become part of the Naval Reserve. This does not mean that all would be called up,[3] but that it might be in two branches, Military and Civil;

[1] By the end of August 15,241 were mobilized.

[2] Lecture at Royal Naval College, March, 1921.

[3] I am of opinion that every one of suitable age—male and female—should be called up in case of war, but their place and duty should be so regularized as to cause as little upset as possible.

those not called up would remain in the Civil Branch. This would regularize the arming of merchant vessels for defence, and bring the whole of our sea personnel under naval discipline.

It is a good thing for the Navy to have at hand a body of men trained to the sea and able to take their place at once in the war fleet. But so far as we can see to-day the Admiralty has no very clearly defined policy as to how these men are to be used and allocated. There is, of course, the wealth of experience of the late war to go on, but even so I suggest, with due deference, that it might be well if we knew more of what will be required of the Royal Naval Reserve in future.

The R.N.R. Officer.

The promotion of officers in the R.N.R. has been improved; with the progress in their status in the Mercantile Marine more credit is given to actual R.N.R. work, but the actual command of a ship in the Mercantile Marine controls promotion to Captain. Service afloat in the Royal Navy for twelve months must be very difficult for R.N.R. officers to fit in, yet it is a good thing and some of the big Companies are very generous and patriotic in this respect.

The retirement of officers in accordance with certain hard and fast rules might well be altered in many cases. I am aware that certain relaxations have been made but more still are wanted. For instance, in many places abroad, R.N.R. officers hold important positions connected with maritime duties, which bring them in constant touch with shipping and sea-trading generally. Again, these officers are familiar with the geographical and meteorological surroundings of the locality with which they are connected and could, therefore, become a centre of information and intelligence on a sudden outbreak of war. They could also be the moving spirit in the local Reserve Force where one might and should be formed. Yet in present conditions such an officer must retire because he is regarded as being relegated to shore service. It seems permissible to compare these officers with those naval officers who from time to time find themselves out of active employment but who, nevertheless, retain their positions on the active list. Several cases of R.N.R. officers who have found themselves in this position have come under my notice and, of course, there must be many I know nothing about. I think this is a matter that should receive some thoughtful consideration from the Admiralty. I am aware, of course, that all retired officers are now, and rightly, liable to be " called out " but I should like to see these men with special qualifications more fully recognized by the authorities.

Finance.

The grant in the Naval Estimates in 1926 for the Royal Naval Reserve was £144,000 and it is surprising what an amount of good material the nation gets for a sum quite small compared with many grants. The Deck branch naturally absorbs most of this sum. The only

comment I have to make is that, as I have already remarked, I think the Accountants' Branch could well be reduced and the money used to better advantage in the Deck Department; it is there more than anywhere else that we want the men.

The estimates for all Reserves stand as follows:—

Royal Naval Reserve	£144,000
Royal Fleet Reserve	223,680
Royal Naval Volunteer Reserve	68,500
Reserve of Retired Officers	105
Royal Naval Auxiliary Sick Berth Reserve ..	8,750
Special Reserve of Royal Marine Officers ..	545
Special Reserve of Royal Engineer Officers, R.N.	500

In relation to these figures, it is also of interest to note that the following are the contributions to the naval expenses of the Empire:—United Kingdom 74 per cent., Australia 7.7 per cent., New Zealand 2 per cent., Canada 12.5 per cent. and South Africa 3.8 per cent.

Miscellaneous Matters.

The question of having armaments ready for, or of actually arming, merchant vessels is a difficult one. The principle is of course not new, but weapons soon become obsolete and it might be well, in building selected ships that might be of service during a war, to strengthen them in certain places so that guns could be quickly mounted on board. There is no necessity for great expenditure on this strengthening and the Government might well be asked to contribute towards the expense. In 1886, the Admiralty adopted the policy of keeping armaments for thirty vessels in store at Portsmouth, Devonport and Chatham. Shipowners, and I think many naval officers, believed before the war, that merchant ships would never be sunk on sight. In lectures I gave at the Royal Naval College in 1901, I emphasized this danger which we now know to our cost was real enough.

While every facility is given for R.N.R. officers to serve in the Royal Navy and become familiar with their general surroundings therein, nothing is done to give R.N. officers an intimate knowledge of life on board a merchant ship. This could be done by a temporary exchange of duties.[1] Soon after I had advocated this in 1921, but probably quite on their own initiative, two young naval officers took a voyage to Australia and back in steamers as A.B's, thus going one better than my suggestion. They happened to be on board a ship homeward bound commanded by a friend of mine and he spoke in the highest terms of the way they worked. He would have known nothing about them, had they not given him their confidence on the understanding that he kept their secret and that they should remain unnoticed. During the war the ignorance of

[1] I see this has recently been supported in other quarters and in Parliamentary Debates.

some naval officers on the conditions of life in the Mercantile Marine might have led to lack of harmony if not actual discord instead of co-operation.

It is very desirable that there should be interchange of visits between officers of the Royal Navy and Mercantile Marine, especially of the Senior Officers. Some Merchant Service officers try to establish this custom but they labour always under great difficulties for not only have they little or no leisure time at the "calling hour" but there is the difficulty of getting a boat, for everyone in a merchant ship is very busy and a boat requires at least four hands. An officer on the Australian station in writing to me the other day, specially remarked on this point because he felt that the Royal Navy and Mercantile Marine were again drifting apart. Curiously enough, just before he wrote to me he said they had had a visit from the Captain of a foreign merchant ship, which was duly returned. He said the smartness of the foreigner's boat and crew was much commented on. These visits need not be very formal affairs nor is there the slightest necessity for any elaborate entertaining, they should be simply visits, with perhaps a walk round the warship for the Mercantile Marine officer and on the return visit the same for the naval officer. When at sea, I was often able to pay visits, even when in a sailing ship; while, afterwards, in cable ships, conditions were not so difficult for these courtesies.

In connection with this matter, I should like to see visits to the Royal Naval College by a party of leading R.N.R. officers such as I was able to arrange in 1921 through the kindness of Captain The Hon. R. A. R. Plunkett-Ernle-Erle-Drax, then Captain of the Naval Staff College, when we had a most interesting and instructive time. I suggested then that visits of parties of, say twelve to twenty, R.N. officers to the big Commercial Docks would be useful. They would go there without formality and just see all operations of loading, unloading, etc. It could easily be arranged for them to go on board selected ships and for an officer in each to take them round. There should be no entertaining or stoppage of work.

One hesitates rather to bring such a matter as Decorations[1] forward, but it may forestall some comments on the colour of the R.N.R. ribbon and the order of its precedence. It would almost seem as if both had been laid down quite haphazard. Curiously enough in another branch the colour of the ribbon has been altered at their request. The fact that the R.N.R. are professional or "regular" volunteers should count for something and a distinction in the ribbon colour made accordingly. Personally, with the exception of the V.C., the A.M., and the O.M., I see little use to worry about precedence, but as it is established the R.N.R. have a most distinct right to a better position.

Royal Naval Reserve officers must be thoroughly impressed with the fact that science plays a great part in modern warfare, but it is

[1] The R.D. decoration was introduced in June, 1909.

practical science, and the instruction in it should take this form. There is a tendency in the Royal Navy to work in watertight compartments and the knowledge from one department is not diffused enough to give other departments the help they should have, and this re-acts upon the Royal Naval Reserve.

Any criticisms contained in this lecture do not imply that the Admiralty did not fully recognise the war services of the Royal Naval Reserve. The facts that so many well-earned honours were distributed in that force, that the rank of Commodore was accorded to those who had taken an active part afloat in the war, that the honour of A.D.C. to the King was granted, and that three members of the Royal Family—King Edward, the Duke of Clarence and the Duke of Connaught—have become Honorary Officers of the R.N.R. speak for themselves, and it is up to the younger generation to show that they appreciate these honours, won by the bravery and competence of their seniors. Then there was the setting up of an advisory R.N.R. Committee and the appointment of Liaison Officers all of which are beneficial to the Force. The recent passing of the R.N.R. Officers Bill, which places them on the same footing as other Officers with regard to pensions for wounds and injuries incurred in war-time, is very satisfactory.

I should like to see a complete record of the R.N.R. war work written by some man who could set out in detail what the service accomplished during the war. It would form a fine and inspiring record for the younger members. The tables at the end of this paper will give some slight indication of its achievements and sacrifices.

My special thanks are due to Paymaster-Commander Blake Harrold, O.B.E., R.N.R., Registrar-General of Shipping and Seamen, who has been most kind, not only with valuable suggestions but also in furnishing me with some statistics which I am glad to be able to place on record here. I also wish to thank Captain Altham, C.B., R.N., for some valuable suggestions and for the interest he has taken in this paper. I am grateful, too, for the assistance of a number of distinguished Naval Reserve officers who took active part in the war and many of whom were trained on board the "Worcester."

DISCUSSION.

ADMIRAL SIR REGINALD TUPPER, G.B.E., K.C.B., C.V.O.: It is a great pleasure to me to come here to-day and support my old shipmate and friend, Sir David Wilson Barker. As Sir Lewis Clinton-Baker has said, it was my privilege to serve as a Flag Officer right through the war with the R.N.R., the Mercantile Marine, fishermen, etc., in various appointments, so that I had the great advantage of seeing them at their *best*.

I want, in the first place, to join issue with Sir David Wilson Barker in what he has said about the R.N.R. Accountant officers. I think it is just as necessary to have Accountant officers, R.N.R., as Deck officers or Engineers. In addition to performing accountant duties many of them in the last war were employed

on other most important work, such as coding and de-coding telegrams, secretarial work in the Admiral's office, and such-like work. The number of Accountant officers we have in the Royal Navy is nothing like so large as the number that is required when the fleet is on a war footing, therefore it is a great advantage to have these Accountant officers. I cannot say that I think the amount of money spent on training Accountant officers for their duties in the R.N.R. is wasted.

Personally I would like to see a great deal more money spent on educating officers in all branches of the Mercantile Marine and in the R.N.V.R. than is done at present, because I look upon the Mercantile Marine and the fishing fleet, especially the Mercantile Marine, as *the* key industry of the country; I say *the* key industry because on the welfare and efficiency of the Mercantile Marine every other industry and the greater part of our food supply depend. In war-time, as the lecturer has said, we of the sea all work as one, and therefore it is in my humble opinion absolutely necessary to encourage as many boys and young men as possible to study sea work. Every encouragement should be given to so-called landsmen to get a knowledge of the sea: of yachts, of boats, motor boats and everything else that will float. The more our countrymen and our countrywomen will study the sea in all its aspects, and try to grasp how greatly our welfare depends on the use we can make of it the better it will be for the Empire.

The lecturer has alluded to the sore feeling which officers in command of merchant ships felt when their ships were taken over and converted into armed cruisers, and naval officers were placed in command. I had the command of a force called the 10th Cruiser Squadron. All the officers in command of those cruisers it is true were Royal Naval officers. There had been no opportunity of training our Naval Reserve officers to *command* men-of-war during the long peace that existed previous to the last war. We had trained a certain number to perform subordinate duties, but there is a great deal of difference between commanding a man-of-war, whether in war-time or in peace-time, and in carrying out the ordinary duties of Deck officers. The Mercantile officers who had been in command of these ships before they were converted into warships generally performed the navigating duties, and took a great deal of the responsibility—not, of course, the entire responsibility because the Captain is always responsible—entailed in looking after the navigation of the ship, off the shoulders of the naval officer who was appointed to command. They were not relegated to the scrap-heap and therefore had plenty to do. I went on board every ship in my squadron at sea and these officers seemed to be quite content; in fact they rather gave me the idea that they were quite pleased not to have the worry of supreme command. It was not a question of actual fighting in action. No doubt they would have done every bit as well fighting an individual ship action as anyone of us would; but the point to be borne in mind is that when you are working a squadron and commanding a lot of ships that have to be handled by signal, it is a great blessing to have officers in command who can understand what their Admiral wants. That is the whole thing. I can tell Sir David Wilson Barker that is the reason why that system was decided upon; you must work as a band of brothers and know mutually what your Captains are going to do under all circumstances. That, if I may say so, is the answer to that point.

Another point that has been raised relates to the necessity of merchant ships being strengthened in peace for use in war. Long ago there was an Armed Mercantile Cruiser Committee of which I happened to be the Secretary. It was then enacted that any merchant liner company that chose to have their ships

made in a certain way, so that they were strengthened for taking guns and with the steering gear below water, would be the first to be taken up by the Navy in time of war. It was a good thing that this was done because there were many efficient ships like that when war broke out. The "Alsatian" was one of them. Ships that had not been strengthened took a long time to prepare and cost a great deal of money, whereas those ships that had been previously strengthened when they were being built cost very little more than would have been the case if they had not been built in that way. That is the answer to that point, it *has* been foreseen and it is being done at the present day.

As regards the air, I think it is a splendid thing that Sir David Wilson Barker has brought up the idea of selected Mercantile Marine officers being given flying training. If the Companies can spare some of their officers for this purpose it will be one of the greatest things they can do to help the country. In addition to encouraging their Officers to join the R.N.R., it would be a great thing if they would also encourage them to spend a short time in the Royal Air Force learning to fly over the sea, or to qualify as observer over the sea. It is quite true, as Sir David says, that flying over the sea and recognizing objects on the sea is an entirely different problem from flying over the land. I personally have done both. I happened to have some Air Force officers serving under me in the North, and they had been trained on the land. I sent them out to look for submarines. Two or three times they actually saw submarines and came back again and told me about it, but they did not drop bombs on them or go down to them. They did not recognize clearly what it was at the time. They were not sailors; they did not know what to look for and they did not know what to do. If you want to have an efficient air force over the sea you must have men who know something about the sea and are trained to work up in the air over the sea. The more aircraft there are flying about the world the more we want sailors to take up air work.

Sir David Wilson Barker referred to the question of smoke screens and paravanes. We had both. Any number of merchant ships were fitted with smoke bombs at the stern ready to make a smoke-screen if it was wanted. Paravanes were supplied towards the end of the war and they were very efficient indeed. On one occasion I went through a minefield and we brought up two mines on one side, and one on the other which would otherwise have blown up my flagship. I have no doubt that R.N.R. officers are being trained now with paravanes, smoke screens and gas masks.

The transfer of R.N. officers temporarily to the Mercantile Marine would, I think, be a very good thing if it could be done. The thing that would militate against it is that if we transferred some officers from the R.N. temporarily to the Mercantile Marine it is possible that we might be displacing officers in certain Companies because there are not enough billets to go round nowadays. There are, unfortunately, more people who want billets at the present time in the Mercantile Marine than there are billets for them. Foreign nations such as Japan, Italy and one or two other nations have certain ships in their Mercantile Marine told off for naval officers.

I should like before sitting down to thank most warmly the officers and men of the R.N.R. for the excellent way in which they carried out their work under me during the war.

CAPTAIN SELWYN M. DAY, C.B., D.S.O., R.D., R.N.R.: If I may express the dominant feeling of shipmasters at the present moment, gained from their

experience before the war, during the war and since the war—such as I and many others like me have had—it is that there appears to be no proportionate recognition on the part of the proper authorities of the increase of the responsibilities of the shipmaster afloat in war-time. The shipmaster is responsible primarily to two senior authorities on shore, the Board of Trade and the Admiralty.

The Board of Trade are responsible, on their part, for providing the shipmaster with competent assistants in the safe navigation of his ship. The Admiralty are responsible for instruction of the shipmaster in the defence of his vessel; and it is perfectly obvious that the shipmaster will, in the future more than in the past, have to co-operate with the naval effort to keep his ship afloat.

As regards this increased responsibility, it is necessary to bear in mind that a great change has, of late, taken place in the nature of the operation of sea adventure. Consequently the shipmaster expects, indeed it is his due, that he should get at least up-to-date assistance in the navigation of his ship. Instead of that, what has happened? Twenty years ago foreigners sent their sons to be educated in the British Nautical Schools because they were recognized as the best; but they no longer send them here. Our system is on a lower standard than that of any European power. If officers, entering for the British Mercantile Marine, pass an examination, and it is of a lower standard than that of any of their foreign rivals, it requires a fund of self-complacency to imagine that some racial quality will none the less assure an equally competent staff. That is why I state that the Board of Trade have not recognised our position or our responsibilities.

As regards the Admiralty, in 1914 there were 1,255 executive officers on the active list of the R.N.R. compared with 1,046 on 30th June, 1926. Consequently shipmasters in 1914 had distributed in their ships for the service of the merchant fleet a larger number of officers who had been trained in the use of war-like appliances than they have at the present time, although there are more ships that require defence and a smaller navy to defend them. My suggestion to meet this defect is that instruction in the use of those weapons which will be placed in a ship for its defence should be given to every master-mariner. The practical man at sea wants to see the men coming after him educated up to the same relative standard that he acquired himself, also, that there are, at least proportionately to the total number, as many officers trained in the use of arms against the next war.

ENGINEER-CAPTAIN ONYON, R.N.: I have been looking into the question of how the number of Royal Naval Reserve Engineer officers compares with those in other branches. From a current Navy List I found that there were 1,338 executive officers and 136 engineer officers. It is not, however, quite fair to quote numbers only; we must take the numbers in comparison with the number of officers serving on the active list. Working it out in that way I found that there were about 29½ per cent. Deck officers and 4½ per cent. of Engineer officers (Lieutenant-Commanders and Lieutenants) in the Naval Reserve, and over 100 per cent. of Paymasters. We have heard what the lecturer and Admiral Tupper have said about Paymasters, and I have nothing to say on that subject, but I am still very much concerned to think that only 4½ per cent. of Engineer officers are serving in the Royal Naval Reserve. Naturally I have wanted to know why.

I called at 58, Victoria Street where the Admiral of the R.N.R. presides, and I discovered there that they only provide as many engineer officers as the Second Sea Lord of the Admiralty requires. So I walked across to Whitehall and went to the Second Sea Lord's office, and I discovered that they did not want

any more engineer officers for the R.N.R.—that they only wanted fifty Engineer Lieutenant-Commanders and Engineer-Lieutenants, I think it was. There are only forty-two, as a matter of fact, and they thought that number quite sufficient; they could not absorb any more; they could not use them if war broke out.

Last night I found in my study a Navy List of October, 1914, from which I learnt that at that date there were three times as many engineer officers in the Royal Naval Reserve as there were in July, 1914, that is to say, the number of officers that was considered sufficient in July had been multiplied by three in the first three months of the war. Therefore the reply I got from the Admiralty about it not being necessary to have so many was hardly borne out by what happened during the war; it must also be remembered that towards the end of the war the numbers were very much greater still.

If Sir David Wilson Barker can in any way help us to increase the number of engineers in the Royal Naval Reserve he will be doing us a very great service. I ask you to try and use your influence to make it imperative that every Superintendent-Engineer in this country of any big steamship company shall necessarily be an Honorary Engineer-Captain of the Royal Naval Reserve. If we get that we shall get a long way, because if the Superintendent-Engineer of each company is a Royal Naval Reserve officer he will see to it that the officers he employs in his ships take an interest in the R.N.R. and they will join as well. It is only by those means that we shall increase the number of engineer officers in the Royal Naval Reserve. At the present time I am quite sure we are woefully short in numbers. We ought to multiply the number by ten. My own feeling is that it should be made attractive to every engineer of the Mercantile Marine to join the R.N.R.

CAPTAIN L. A. BROOKE-SMITH, R.D., R.N.R.: I am afraid I am rather out of touch with the Reserve, but there are one or two points which the lecturer has raised which are, I think, of very great interest.

I believe at the present time it is customary for the boys who are nominated from the "Conway," the "Worcester" and Pangbourne as Midshipmen, to go straight on board a battleship or large cruiser for six months' training. From the Navy point of view, pure and simple, I have no doubt that that is excellent, but you have also got to think of the effect it is going to have on the Merchant Service. When we send our sons to sea in the Mercantile Service to get them trained, the first object we have in view is to make them good Master Mariners. There are necessarily differences between a commercial and a naval service; differences in ideas, in traditions, in mode of discipline and so forth; but if you imbue a boy at the tender age of sixteen or seventeen with too much in the way of naval ideas he becomes unsettled on board a merchant ship. I cannot say that I have any experience and perhaps I am theorising; but I was talking the other day to an officer who is responsible for the training of the apprentices in one of the big steamship lines which takes a very great interest in their youngsters; and he was exactly of the same opinion. I therefore put forward the idea that when these youngsters become Sub-Lieutenants, R.N.R., they could exchange with a similar number of young officers who are Sub-Lieutenants, R.N., when, I think, both Services would gain.

The next point that I should like to mention is that I think it is necessary to bear in mind that there are many officers in the Merchant Service who have special bents. There are some who take up hydrographic survey; there are a good many others who make a speciality of meteorology; and Admiral Tupper

said a good deal about flying. In the Merchant Service there are a great many men who have acquired an exceptional amount of knowledge of meteorology by experience and, as I have something to do with the co-ordination of that work at present, I can tell you that there are a great many of them who are specializing in it, and I think it might be worth while for the Admiralty to go into that question. My colleague on my right, Commander Garbett, is arranging for a course for naval officers in meteorology and they also are doing some very fine work. You cannot shoot at long range with a modern gun without knowing something about the upper winds, any more than you can fly an aeroplane.

CAPTAIN SIR DAVID WILSON BARKER said in reply: I very much appreciate the remarks made by my old shipmate Admiral Tupper. I quite see his point about the command of merchant ships, but I am afraid that in spite of them I do not feel very much inclined to give way. I had chiefly in mind the command of merchant ships which might be on cruising expeditions, free and independent of fleet operations. I have mentioned a few examples to show that merchant Captains *can* fight their ships when they had to do it.

Why transfer the officers temporarily to the Mercantile Marine? I advocated in my lecture in 1921 that an exchange should be made—not that a naval officer should be put into a merchant ship, but that there should be an actual exchange as Captain Brooke-Smith mentioned—that is to say, an R.N.R. officer should be appointed to the naval ship and he should be replaced by an R.N. officer in the merchant ship. I see no reason why this could not be arranged, in which case there would be no unfairness through a Mercantile Marine officer being displaced by a naval officer.

Admiral Tupper mentioned the fact that merchant ships are being strengthened. I knew that to be the case, but those are the sort of things which are apt to get forgotten when there is no national necessity. I mentioned it chiefly with the idea that the subject should not be lost sight of. I think I know the Company that was alluded to. The head of that Company was a very wise man in making provision for guns on board his ships. The head of another company, equally as great, took the opposite view, namely, that there should be no guns on board and no strengthening of his ships.

Captain Selwyn Day alluded to the shipmaster's increased responsibilities in war. Of course one realizes that they are very great. I think his suggestion that all Captains should go through a war course might be a good thing if it was a carefully arranged course, which would give them an idea of such things as convoys and other matters with which the Mercantile Marine officer will be concerned in wartime.

Engineer-Captain Onyon referred to the position of the R.N.R. engineer officer. I think, however, the existing state of affairs is not altogether the fault of the naval authorities. Although I have every sympathy with them, I fancy the engineers themselves have not come forward in sufficiently large numbers to make the present position satisfactory. I am sure that the naval authorities and all of us will be only too glad to see the engineers take their place with us in everything we are doing, because after all we are all working for the same ends.

Captain Brooke-Smith very advisedly spoke of the necessity of developing meteorology. He knows well that I am entirely with him on that matter. Naval Reserve officers can advise the authorities very much better on geographical and meteorological matters than anybody else coming in from outside.

I thank you all for the kind remarks you have made.

THE CHAIRMAN.

Consequent on what we have heard from the lecturer and in view of the various criticisms that have been made I propose to make a few remarks. Sir David mentioned the Accountant officers. Personally I entirely agree with Sir Reginald Tupper's remarks and might mention that they only cost a matter of about £5,000 a year as against between £50,000 and £60,000 a year for the training of all R.N.R. officers. I think that £5,000 a year is well spent. It must be remembered that most of the Accountant officers R.N.R. are very capable business men. They include many bank managers and the heads of large firms of chartered accountants, etc.; and the youngsters that are being trained up in their wake. I should be very sorry indeed to see the R.N.R. Accountant officers done away with.

The lecturer mentioned the question of the training of fishermen. We are endeavouring—and Mr. Blake Harrold, the Registrar-General of Shipping, is helping me all he can in this respect—to get these fishermen when they enrol in the Royal Naval Reserve to join what is now called the Patrol Service. The officers in the Patrol Service are Chief Skippers and Skippers R.N.R.; they are recruited from the captains of large trawlers and drifters. Their war work is entirely mine-sweeping, and they are called the Naval Patrol Service. We hope to recruit all patrol ratings from fishermen, who are a splendid set of men. Their training centre at the present moment is at Portland, where they are trained in six Admiralty mine-sweepers and two Admiralty trawlers. This establishment can very easily deal, not only with our present numbers, but with the numbers we hope to get in the future. The expense of training these fishermen at two or three other ports round the coast, as Sir David Wilson Barker suggests, would be far too great.

The lecturer suggested that he thought it would be a good thing if young officers went to sea as probationary Sub-Lieutenants R.N.R. rather than as Midshipmen R.N.R. I entirely agree with him. In the past a large number of lads have been sent to sea direct from the "Worcester," "Conway" and Pangbourne, as probationary Midshipmen R.N.R. In 1924, from these three establishments no less than seventy-two joined the Mercantile Marine in this capacity. The consequence is that the list has been swamped by youngsters, and we have only been able to enter very few experienced R.N.R. officers as probationary Sub-Lieutenants at or over the age of twenty-one. At the present time we have a waiting list of over fifty most desirable candidates. Last year it was decided to reduce the numbers entering from these training establishments in a year from seventy-two to fifty-four, but that number was still too many. From the 1st May this year the number will be further reduced to twenty-seven. It does not follow that because these youngsters do not join up straight away as Midshipmen R.N.R. that they will not eventually become R.N.R. officers. It is hoped that, as soon as they attain the age of twenty-one, they will join up as probationary Sub-Lieutenants, provided they have got their Second Mate's ticket. Between twenty-four and twenty-seven they can still join as probationary Sub-Lieutenants, but they must have their Master's certificate. Those are the officers that we really require as they are already trained seamen and have passed the necessary examinations for Masters.

Sir David mentioned that he thought it was a good thing for the youngsters to be trained entirely in small ships. I regret to say that I think absolutely the opposite. There is nothing worse for a youngster than to do his training in a small ship. He thinks himself no end of a fellow, and it does him no good.

Whereas if he goes to a big ship he gets "screwed up" and well looked after, and I think, as youngsters, we are all the better for being "screwed up." Midshipmen at the present time serve four months in large ships and then two months in destroyers, and I think that is a very good arrangement. When it comes to entering as a probationary Sub-Lieutenant, the training consists first of all of a six weeks' gunnery course, followed by a six weeks' course afloat. Then they are confirmed from probationary Sub-Lieutenant to Sub-Lieutenant proper, and later on they have to serve a year in one of H.M. ships.

As far as the Naval Air Arm goes, this matter is receiving the greatest attention on the part of the Admiralty, the Air Ministry, and some of the larger Mercantile Marine shipping companies.

Then Sir David mentioned smoke screens and gas training. It is proposed, as in the last war, to supply merchant ships as soon as possible with smoke boxes. As far as gas training goes, every officer at the end of his ordinary training has to do a four and a half days' gas course, and every rating, without exception, has to do one day's training.

The lecturer seems to think that it is hard luck that officers serving abroad n shore appointments should be placed on the retired list. The reason is not very far to seek. There are only a limited number of Captains and Commanders on the Active List, and if officers are not retired for non-sea service we shall never get any steady flow of promotion. Promotion is all too slow as it is. The regulation is that if a Captain has not been to sea for four years or a Commander for three years he is automatically put on the retired list, and I must say, that I think it is a very good regulation.

The lecturer expressed anxiety because he thought the R.N.R. and the Navy were gradually drifting apart and that their relations were not as cordial as they were. I venture to hope that it is not the case. Captains and officers of the Navy are very much alive to the necessity for the *entente cordiale* between the two Services.

Then he mentioned the colour of the ribbon of the Reserve decoration. That matter must rest with the R.N.R. Advisory Committee. I can only say that whenever I have had the pleasure of presenting one of these Reserve decorations to officers they always say what an extraordinarily pretty thing it is, and they have never hinted at any change of colour of the ribbon being desirable If the Advisory Committee have any suggestions to offer and they bring forward strong enough arguments I have no doubt the Admiralty will be delighted to recommend a change of colour. As far as the order of precedence goes, I do think it is placed a very long way down. The R.N.R. decoration is seventy-ninth and the R.N.V.R. is eightieth.

With regard to Engineer-Captain Onyon's remarks, with reference to the shortage of engineer officers, I fancy that he is correct in stating that the engineer officers of the Mercantile Marine are not too keen on joining the R.N.R.

Captain Selwyn Day's point I did not quite understand. Were you referring to the whole of the Mercantile Marine Captains ?

CAPTAIN SELWYN DAY : Yes. My point was that as every Master may have to defend his ship he should have some training and instruction in the arms that the Admiralty would put on board the ship when an emergency arises.

THE CHAIRMAN : In fact he would have the same sort of course that was instituted during the war. You do not mean that he should go through Greenwich ?

CAPTAIN SELWYN-DAY: No, only a short course in the arms that he would be called upon to use. I do not think the point I mentioned has been put forward before and I hope it will be taken into consideration.

In conclusion I should like to thank Sir Reginald Tupper very much indeed for his very interesting remarks, and I thank Sir David Wilson Barker most cordially on behalf of the audience and myself for his most interesting lecture. I am sure Sir David will forgive me if I did not agree with every point that he made. (Cheers.)

The resolution of thanks was carried by acclamation.

ADMIRAL SIR SYDNEY FREMANTLE, K.C.B., M.V.O., in proposing a vote of thanks to the Chairman, remarked: "In the first place I should like to say as an old member of this Institution how very gratifying I find it that we are able to use the Institution as a means of bringing together the officers of the Royal Navy and their colleagues in the Royal Naval Reserve. If you will pardon me a little personal illustration of this, it was a very pleasant experience to me to find myself by chance sitting this afternoon next to an officer who served under me in the war, and who, as a Commander in the R.N.R. commanding his own ship, officered and manned entirely from that Service, fought one of the most interesting and distinguished actions fought during the war by any ship not built as a man-of-war—an action in which he showed appreciation and quickness of decision and judgment which will be an everlasting credit to the Royal Naval Reserve. (Cheers.)

It only remains for me to thank our Chairman on behalf of you all for his very illuminating, frank and sailor-like summing up of the lecture and the discussion, and I ask you to accord him a vote of thanks by acclamation.

The resolution of thanks was carried by acclamation.

The meeting then terminated.

APPENDIX.

I.—COMPARATIVE STRENGTH OF THE ROYAL NAVAL RESERVE ON THE 1ST JANUARY IN EACH OF THE YEARS STATED.

Ranks.	1914.	1915.	1916.	1918.	1927.
Officers (Deck) ..	1,255	2,117	4,043	5,240	1,039
Officers (Engineers) ..	315	718	1,641	2,195	139
Paymasters	242	529	947	1,342	190 (118 Registrars)
Warrant Telegraphists	—	76	234	311	—
Skippers and Ratings..	16,944	26,339	50,325	56,241	8,421

II.—The Present Authorized Maximum R.N.R. Strength.

Captains	20
Commanders	70
Lieut.-Commanders, Lieutenants, Sub-Lieutenants and Midshipmen	958
Skippers	324
Engineer Officers (of all ranks)	180
Paymasters (not Registrars)	200
Seamen Ratings	6,733
E.R.A.'s and Enginemen	1,355
Stokers	912

III.—War Casualties.

Royal Naval Reserve.		*Mercantile Marine.*	
Officers (including 142 Skippers	941	Masters	414
Other ratings	5,452	Officers	2,251
	6,393	Other Ranks and Ratings	8,992
		Asiatics	2,265
		Fishing :—	
		Skippers	165
		Other ratings	1,191
			15,278

The Honours, Awards and Mentions to Members of the R.N.R. for services in the Great War, 1914-18, amounted to 5,314, including 11 Victoria Crosses, 121 D.S.O.'s and 623 D.S.C.'s.

THE AUXILIARY PATROL IN PEACE TIME

By Lieutenant T. D. Manning, R.N.V.R.

THE Auxiliary Patrol, which assumed such large proportions and performed such important functions in the war has now shrunk to the mere nucleus of a force. Nevertheless, it still exists as an organization for training a non-naval section of our seafaring population in work they may again be called upon to perform; also it has certain peace duties to carry on.

Since the war the Auxiliary Patrol has consisted of two flotillas, the Minesweeping Flotilla and the Fishery Protection Flotilla. Before the war these services were independent, the Fisheries being under the orders of the Admiral Commanding the Coast Guard and Reserves; but since the war there has been a Captain, known as Captain A/P, in command of both sections. For some years after the war the Auxiliary Patrol was largely employed off the Irish coast but since about 1922 normal peace-time routine has been carried on.

First Minesweeping Flotilla.

This flotilla consists of seven twin-screw minesweepers of the "Town" or "Improved Hunt" type. A very large number of these vessels were built during the latter part of the war, many of them being actually completed after the Armistice. In all 125 were ordered, of which thirty-six were cancelled and never completed, and of the remainder thirty-one were sold shortly after the war. Most of these were broken up, but four were sold to the Bombay Steam Navigation Company, one was sold to a Buenos Ayres firm, and a sixth is now in the Siamese Navy. Three were mined and lost.

In addition to the 125 already mentioned, another six ships were completed as surveying ships and renamed after famous surveyors, such as "Beaufort," "Fitzroy," etc. Of these only four remain, the "Collinson," having been sold in 1922, and the "Crozier" being presented to South Africa in 1921.

A large number of these sweepers were given names of small towns along the coast, but were renamed to avoid confusion in signalling. Cases in point are "Gorleston," "Southwold," "Newlyn," etc. Of these, a number were employed in the mine clearance service during 1919.

The present First Minesweeping Flotilla exists for two reasons, experimental duties and training. A great deal of experimental work has been done of late years, with the result that the existing minesweeping gear is very different to that employed in 1918 and far more efficient. As regards training, for several years past Skippers, Deck hands and Engine men of the R.N.R. (Trawler Section) have been undergoing " refresher " courses in minesweeping at Portland, the headquarters of the flotilla, some hundreds passing through every year. In addition to this, officers and men of the R.N.R., R.N.V.R. and R.I.M. are constantly with the flotilla for training in minesweeping. There are special quarters for the Trawler Section, but the other officers and men are generally accommodated in the ships of the flotilla.

In addition to the training of Reservists, the flotilla provides training facilities for officers and men of the Royal Navy and, being constantly at work, ensures that a good proportion of such officers and men know something of minesweeping.

Until quite recently a large reserve of twin-screw sweepers of this type were kept in reserve at Sheerness, known as the Central Reserve and, in addition, nine are in reserve at Malta. This summer, however, orders have been given for most of the Central Reserve to be sold out of the Service.

The ships of the First Minesweeping Flotilla are occasionally used for Fishery Protection duties. Since 1924, one of the flotilla has also been detailed each year to attend on H.M.Y. " Britannia " during the regatta season. For the past two years the whole flotilla has accompanied the Atlantic Fleet upon the Spring Cruise to the Mediterranean.

The Fishery Protection Flotilla.

The vessels of this flotilla are distributed in various areas. It consists of two sloops, " Harebell " and " Godetia," known as fishery cruisers; a P.C. boat, the " Dart " ; a P. boat, the " Spey," and five trawlers, known as fishery gunboats. H.M.S. " Harebell " is " flagship " of the Captain A/P and is based on Portland, though much of her time is spent cruising round the coasts, to Iceland, Norway and other Continental countries. By this means the Captain A/P is enabled to keep in touch with the fishing industry both at home and abroad.

All the administrative work of the A/P Flotilla is carried out at Portland.

The duties of the Fishery Protection Flotilla are roughly as follows:

(1) To look after the interests of British Fishermen;
(2) To prevent foreign fishing vessels fishing in British territorial waters;
(3) To prevent any fishing within prohibited areas;
(4) To generally assist H.M. Customs and the Board of Agriculture and Fisheries.

This work goes on all the year round and, generally speaking, the fishermen much appreciate the efforts of the flotilla. They always have a friendly word for officers and men when they meet them, especially when in foreign waters.

Foreign ports are visited from time to time and distant waters such as Iceland and North Russian Fisheries are also visited. This year, for instance, the " Harebell " and the " Doon " have been to Iceland. Gunboats are always working with the Herring Fleet on their way south to prevent any " incidents " with foreign drifters, such as wilful damage to gear, etc.

From time to time foreign trawlers are arrested for fishing within the three mile limit, no less than five being caught in August this year off the East Coast. It is a somewhat sore point with our fishermen, that these foreigners get off so lightly in the police courts, while our men, if caught in foreign waters, are fined very heavily, lose their gear and even their boats at times, and may even be imprisoned. Foreigners are seldom fined more than £10 in England, indeed, I have heard that this is the maximum fine ; it is true they also get their gear confiscated and sometimes their fish.

A short account of a typical arrest may be of interest. When on passage from Lowestoft to Sheerness on a summer's morning, one of H.M. Fishery Protection gunboats sighted three small vessels under sail inside the Aldeburgh Napes. Speed was increased in order to close them. On nearer inspection, it was seen that all were French trawlers with their trawls down, or rather they were hauling in their trawls by this time. The first boat was reached before she had got her gear in, bearings were taken which placed the ship well inside the three mile limit, and as soon as the gunboat came alongside, an officer and one hand boarded. In this case there was no question whatever as to the guilt of the captured trawler ; he was caught red-handed. The skipper was ordered on board and shown his position on the chart, but as he spoke no English it was a little difficult to make him understand that he was to proceed into Lowestoft. Having wasted as little time as possible, he was cast off, the Boatswain and one sailor being left on board, and chase was made after the other two boats, which were now making off at full speed.

All three trawlers were fitted with excellent motors which gave them a speed of about nine knots so that, as the gunboat had a maximum speed of just over ten knots, it was nearly an hour before the second boat was caught. It is probable that she stopped as soon as she saw the gun's crew closing up ! This skipper was rather more truculent and, indeed, he and his crew looked so menacing that it was deemed advisable to take his boat in tow after putting the First Lieutenant and one man on board. The third boat had now disappeared in a heavy rainstorm and, as she had made off in a different direction, the chase was given up.

Both cases came before the magistrates next day and fines of £10, with confiscation of gear, were inflicted.

THE TERRITORIAL ARMY OF TO-DAY

By Lieutenant-Colonel R. M. Raynsford, D.S.O.

THE road from Northampton to Felixstowe lies over Newmarket Heath. Here on either side of the road stretching far into the heart of the country is glorious ground for the training of soldiers. Yet even to make such a suggestion is, I feel, little short of sacrilege: and so, ruefully, on to Felixstowe where at Languard Fort certain of the field brigades of the Territorial Artillery assemble for their annual camp. A restricted piece of foreshore, barely sufficient for the camp alone, forts, huts, houses all around, and no ground whatsoever available for manœuvre either at hand or anywhere in the near neighbourhood. It seemed a sorry business that the annual camp, the Mecca of the training year, should allow of no more ambitious training than could, in fact, have been carried out on any barrack square. Admittedly there were compensations: the camp lay close alongside the sea and the facilities for bathing were admirable. Felixstowe, too, has many pleasant attributes in the summer months. But let it be clearly understood that the Territorial—though, like all of us, attracted by the amenities of a popular seaside resort—does demand that his fortnight's training should, above all, be realistic and not make-believe soldiering.

There are, of course, some Territorial camps which provide all the facilities which the most ardent soldier could desire—Catterick Camp, for example; there are others which from the point of view of training are moderately good, but there are many—and the Eastern Command seems to have more than its share of these—which are undeniably bad, little miserable patches of training ground, with "out-of-bounds" areas all around, barely sufficient to exercise a platoon and utterly useless as far as a satisfactory battalion, much less a brigade, manœuvre is concerned. If the camp is utterly indifferent as a training ground it seems to me it would be much better not to waste public money, also officers' and men's time by holding it at all. From every point of view it is unsound to hold a camp just for the sake of holding it nor unless some real tangible result is going to accrue. The only reason for the existence of the Terriotorial Army is that it should be able to take its place alongside the Regular Army. If it is inefficient, then whatever money is spent on it is wasted. The nation owes it to the Territorials to provide every brigade with a camp which does, in fact, afford facilities for efficient training. Is this an impossibility? Yes, it probably is, unless some

modified form of the Manœuvre Act is brought into play and Parliament realizes that national insurance against disaster, as effected by the Territorial Army, is of more importance than the ultra-sacred rights of private property. The Council of County Territorial Associations, though admittedly approaching this subject from the point of view of economy rather than of efficiency, have urged the War Department to consider the wider institution of standing camps and it is along these lines that the solution of the problem will no doubt be found.

Water supply is, of course, often a difficulty but not so great a difficulty as it used to be, for soon there should not be the same necessity for training areas being so close to the camping ground as has been the case hitherto. For example, a brigade of artillery, complete with six-wheeled tractors, has obviously a much wider radius of action than a horsed brigade. Infantry brigades present a difficulty, so long as they adhere to their present obsolete and discredited organization. It is not a question of mechanization or non-mechanization, of " Progressive " or " Die-hard," but just a matter of cast-iron common sense that the unarmoured infantryman cannot advance against the vastly increased fire power of the defence, and most certainly cannot close with an enemy plentifully supplied with machine guns. The present day brigade of four battalions, each of four companies, all thoroughly immobile, who spend nearly all their time in camp carrying out a series of " cenotaphic "[1] exercises is a gloomy spectacle.

A battalion consisting of two light infantry companies specially trained for work in intersected and mountainous country, and a machine gun company, together with mechanized first line transport would at any rate have some *raison d'être*, especially if there was hope of a company of tankettes being added later. A brigade consisting of three such battalions and an armoured car company, equipped with up-to-date armoured cars instead of the obsolete cars which the few Territorial armoured car companies which now exist have to compete with, would be a good proposition. It would be mobile, which as I stated above has a distinct bearing on the provision of training grounds; it would make a much more spectacular appeal to the public and so benefit recruiting; it would also be much more in keeping with the role which the Territorial will be called on to play at the outbreak of war than the present cannon-fodder or rather machine-gun fodder infantry brigades. Incidentally, a new brigade group organization such as I have suggested might go hand-in-hand with a scheme under which the units administered by one or more Associations coincided with the units forming the brigade group.

Such an organization means, in each battalion, the lopping off of two companies, the institution of a machine-gun company for the present machine-gun platoon, and I would add the further suggestion—an

[1] A " cenotaphic " battle, in the language of Thomas Atkins, is one in which the participants are practically bound to be killed.

unpopular one, I fear—the lopping off of the band. But as far as marching is concerned, the use of a band in this era of mechanization is becoming an anachronism. Units are allowed to expend 7 per cent. of their establishment grant on the upkeep of their band, *i.e.* about £90 in the case of an infantry battalion, and in actual practice usually spend about double this amount. Can it be truthfully said that the units get value for this expenditure ?

It is a curious fact that amidst all the outcry that arose at the beginning of the year over the proposals of the Secretary of State for War for the reduction of the Territorial Grant, scarcely anything was heard about his perfectly sound suggestion that the establishment of infantry battalions be reduced to 500. The Council of County Territorial Associations, seething with indignation over the abolition of the bounty, attacked the War Secretary in his lair, and as a sop to their fury he immediately jettisoned his blameless proposal for the reduction of Territorial infantry establishments, though apparently he only made the proposal from the point of view of economy and not in the least from the point of view of its undoubted benefit to the Territorial organization *vis-à-vis* the fact that infantry is ceasing to be the decisive arm and that the adoption of armoured vehicles and mechanization generally is inevitable. In all the heated Council debates which occurred at the Westminster Guildhall, as far as I know, this latter point of view never arose except on one occasion when I attempted to bring it to the fore myself; an attempt which aroused no flicker of interest and was immediately waived aside by the Chairman. It seems to be the War Office policy to keep the Council entirely in the dark as to training developments, on the assumption no doubt that the Associations have to deal with administration only. If only the C.I.G.S., or the Director-General of the Territorial Army, had come down to the Westminster Guildhall and had a straight talk with the assembled Council, how very much better it would have been for everybody. However, such a course of action seems contrary to all tradition, while no doubt the War Office was, at the time, somewhat hampered by the official dogma "infantry is the arm which in the end wins battles," a dogma which although it has been watered down by recent amendments in Field Service Regulations, is still, sad to relate, the basis of all infantry training in the Territorial Army.

The question of co-operation between Regulars and Territorials is a very important one. As far as the headquarters of divisions are concerned one can only pay a tribute to the whole hearted keenness of the divisional staffs to achieve successful results in the face of difficulties, financial and otherwise. A case in point was a scheme for the pooling of horses and tractors which was carried out by the 54th (East Anglian) Division during the camping season this year. It was the first time such a scheme had been carried through, involving arrangements for units administered by different Associations and

trained in different places. Many difficulties were encountered, *e.g.* persuading the field artillery brigades concerned to hold their camps at such periods as would allow of their using the same horses and tractors, persuading the Territorial County Associations concerned—and they were affected in varying degrees—to enter into the scheme, and, most difficult of all, persuading Finance. Finance was not at all enthusiastic. The system hitherto has been that the supply of horses allowed has been governed by the strength of the battery. Finance wished to keep strictly to the letter of the law. Finance saw no good reason for paying for four tractors when the strength of the battery only entitled it to the use of three and a half, argued on the basis that one tractor displaces so many horses. Finance was not pleased. But in the end all difficulties were surmounted and the scheme was an unqualified success. The chief lesson learnt seems to be that the provision of horses and tractors for annual camps should be a War Office affair; further that, as hitherto Associations have reckoned quite justifiably, on "making a bit" out of their horse-hire grant, they should, in future, receive a financial "quid pro quo" in compensation.

The attachment of Staff College graduates to units during their annual camp, as now carried out, is an admirable plan. They act as umpires during the various exercises, exercises which it seems to me might be more ambitious than they generally are. But brigade commanders seem to acquiesce in a dreary stultifying repetition of company, platoon and small unit training generally, which is of course in accordance with the official doctrine and it is only the bolder spirits who break away from this monotonous programme. Week-end camps are generally so well attended nowadays that it seems absurd that N.C.O's should not have an opportunity of more advanced work than a mere grounding in essentials, when the time for the annual camp arrives. Yet I read of one brigade—and it is not by any means unusual—who were "tackling the elementary practices with which these battalions will continue until well into the second week of their training. Indeed the brigade commander has only two battalion days in view and those are merely probable"—battalion, mark you, not brigade. As the ground where this brigade was training was peculiarly indifferent, it can be imagined how amazingly dull the training must have been.

As regards co-operation between Regular and Territorial battalions of the same Regiment the situation is a little difficult. Naturally everything possible to promote a cordial relationship between the two should be aimed at, and the idea of an adjutant to a Territorial battalion belonging to any other than the County Regiment is anathema to most of us. But is this always a sound proposition? The adjutant is an immensely important person. He should be a man of some seniority with, unquestionably, war service to his credit. He should be an able lecturer who, moreover, can conduct exercises with and without troops, also sand-table exercises, with ability and confidence. He must be a good

organizer, a man of the world for he will have many dealings with employers of labour and civilians generally; lastly, above all he must have "personality," that absolute *sine qua non* for such an appointment. Now the number of captains who have all these qualifications is no doubt considerable, and I am far from saying that present day adjutants are deficient of them, but in any one particular Regiment it by no means follows that such an one is always available when a vacancy occurs in the adjutancy of one of its Territorial units. Seeing how great our obligations are towards the Territorial Army, I consider that the War Office list of officers recommended for the adjutancy of a Territorial unit should be compiled with as great care as is the list for the Staff College; further, that preference should be given to those officers who have the Staff College certificate to their credit. If this were the case it stands to reason that, as far as the infantry is concerned, the Regular battalions in question could not always be able to produce the right man for the job and he must be found elsewhere. It may be argued that this is, on occasion, done at present. I agree. But the occasions are rare and the point I wish to make is that the regimental connection should not be considered to make up for deficiencies in the other characteristics which I have mentioned above.

The next question is that of Territorial infantry sergeant-instructors and there can be no question that a supply deriving solely from the Regular battalions is not good enough. Not to beat about the bush, it can be quite definitely stated that there are a good many unsatisfactory sergeant-instructors scattered throughout the country. It is far from being a case of inefficiency only; many sergeant-instructors are too young or lacking in war service and it is easy to realize what a drawback this is in units in which probably as many as 75 per cent. of the Territorial N.C.O's are in possession of medal-ribbons. Let me hasten to add, too, that it is not the fault of the officers commanding the affiliated Regular units, who quite frequently cannot lay hands on a real good man. In any case the Gilbertian situation exists that though the officer commanding the regular unit submits the names, it is the Officer in charge of Records who makes the final selection and he, of course, has not even seen the man in question. But I go so far as to say that there should be no more chance of finding an indifferent sergeant-instructor in a Territorial unit than there is of finding one at Hythe or Netheravon. Closely allied to all this is the question of out-stations; you might have the best sergeant-instructor in England, but if he is sent to a dreary out-station with a dreary drill-hall or possibly only a hut in the midst of some essentially agricultural district, sparsely peopled by bucolic inhabitants, it will be a thousand to three that he will lose all his keenness and efficiency as a result of his surroundings. And now that the country is teeming with motor-buses is there any real need for so many little out-stations? Men can come in by bus to their various exercises, and, if there is no motor-bus available, then let the out-stations go; it is no good keeping up these desolate-looking army huts and

hired rooms for the sake of two or three privates, more especially as a reduction in infantry establishments is inevitable.

I will now summarize such suggestions as I have made :—

(1) The War Office and Council of County Territorial Associations between them should arrange for the provision of standing camps which give really good facilities for training, facilities for co-operation between the various arms of the service, and incidentally take into account the wider requirements which ground suitable for mechanized troops will entail. This may seem a formidable proposition, but not nearly so formidable if all Regular Army training grounds come into the picture—for example, why not have infantry brigade trainings consisting of one Regular battalion and two Territorial battalions—not nearly so formidable if all the idols, myths and fetishes which cluster around infantry training as it is being practised to-day are resolutely swept aside ; not nearly so formidable if we have the courage to believe that men join the Territorials from a love of country and sense of public duty and not merely because they want a holiday by the sea ; and finally not nearly so formidable if the political party in power, whether it be Conservative, Liberal or Labour, has the strength of mind to say that such training grounds must be found.

(2) An immediate and drastic reduction of infantry establishments with an immediate increase in the number of machine-guns and in the number of armoured car companies and a gradual increase as funds allow, of mechanized units, such as tankette companies.

(3) The instructional staff of the Territorial Army to consist of the pick of the Regular Army and the very greatest care to be exercised in their selection.

(4) Abolition of the small out-stations with their dreary little buildings, and a determination on the part of Associations to ensure that the more important drill halls are in keeping with the prestige of the Territorial Army, well-kept exteriors with a notice setting forth in bold letters who and what they are, and in which the name of the town in question is always introduced. In these days it is the big town which counts and the susceptibilities of the townsfolk must always be appealed to. This boosting of the town in place of the county may be regrettable but it has come to stay and there is no getting over it. Inside the drill hall everything should be spick and span and up-to-date, a *really good* officers' lecture-room, a *really good* miniature range, and most important, a *really good* institute.

Incidentally, the last suggestion, *i.e.* the abolition of the small out-station, would mean a considerable saving of money to Associations. When sections of a unit are scattered all over a county, the cost of administration is very considerable increased. Caretakers, fuel, lighting, telephone, postage, these are the items which run away with money. The more concentrated the unit, the more economical the cost of administration.

The question of economy as a whole demands attention. A committee appointed by the Council of County Territorial Associations has been examining the whole question of Territorial Army Finance and their suggestions, recently approved by the Council and forwarded to the Secretary of State for War for consideration, are to the effect that only an infinitesimal reduction is possible under the heading of administration, but that there is hope of saving money expended on training. It will be a calamity if the Training Grant should be reduced, except in so far as any reduction of the infantry establishment allows for it, and though admittedly there is no room for economy in the various administrative grants, yet I think there are ways and means of helping the Exchequer out of its difficulties. Let us consider the question of Clothing Reserves. In 1921 the Clothing Reserve of all Associations was nil; in 1926 it had risen to £495,569, a very comfortable sum. At that date the average of the Clothing Reserve as compared to establishment worked out at £2 3s. 3d. per head for the whole of the Territorial Army. Quite a number of Associations varied from £4 to as much as £7 a head. The figure for the County of London, which is noted for its admirably business-like administration, worked out at £1 12s. 5d. per head. Last year when the abolition of the bounty bombshell burst, and frantic efforts were made to avert that catastrophe, an offer was made by the Council to return 25 per cent. of the Clothing Reserve to the Government, a nice little windfall which would have worked out at very considerably over £100,000. The offer was not accepted though there was no question that this sum could have been paid without anybody being very much the worse. But if infantry establishments are reduced there is not the slightest doubt this sum ought to be given up, although, if it is done, it is to be hoped that the Council, thinking for once in a way in terms of training as well as of administration, will demand that every penny be spent on the formation of, say, new and up-to-date armoured car companies which are so badly needed.

Reference to the large surplus funds which stand to the credit of so many Associations is apt to be discreetly avoided. Under this heading we find a net surplus of £187,464 in 1913 expanded to a net surplus of £392,274 in 1926. Fifteen Associations had surpluses varying from £4 10s. per head up to £18 18s. 7d. per head. The County of London worked on a surplus of 3s. 2d. per head. It seems to me a good deal of this might be used to help training requirements. For example, the time has now come when all field batteries should be equipped with

the six-wheeler tractor which has quite clearly proved its ability to satisfy the three main requirements of military transport, viz., first-class road performance, ability to carry out all normal cross-country work, and commercial utility. Battery commanders who used them during this year's training were enthusiastic in their praise. But they had to be hired and it proved a costly business: £300 for the hire of four tractors for a fortnight's training. The War Office has now given permission to Associations to purchase these tractors, but it would be obviously better and cheaper for the War Office to purchase them in bulk themselves and issue to Associations as required. And to help the War Office to do this, why should not Associations surrender a considerable percentage of their surplus funds. It would indeed be a "beau geste." In any case it is no good Associations hoarding their funds as if they were a limited company and piling up reserves against a rainy day. Modern equipment is wanted by the Territorial Army, is wanted badly and wanted now. And the main reason is, in my opinion, that, given really modern equipment, together with really up-to-date training, officers and men are able to take a greatly enhanced interest in their work, and unless the "interest" factor is present, all hopes of successful recruiting must vanish.

A few details with regard to co-operation between Regulars and Territorials have been touched on above. This question seems to me to have an importance which so far outweighs every other consideration that I hope I may be forgiven for once more reverting to it in my concluding remarks. General Sir Ivor Maxse, in the admirable lecture which he gave on the Territorial Army in the Royal United Service Institution in March, 1926, summed up as follows:—"It seems the inevitable conclusion . . . that our future readiness for a big war will more and more depend on the war-preparedness of the Territorial Army." Can there be any longer a possible excuse for the nation in general, and the War Office in particular, not doing its utmost to allow of the Territorial Army achieving that war-preparedness. The means lie ready at hand. For four weeks in the year, say the last week of July and the first three weeks of August, I suggest that the Regular Army should be at the disposal of the Territorials, ready to provide every possible thing that will go towards making their camps a success, officers, men, camping grounds, training grounds, transport, even barracks and their equipment, all these should be made available from the Regular resources; further, as I have suggested above, certain Regular units might form part of Territorial Brigades during the period of camp. The argument will no doubt be vehemently advanced that the Regular Army cannot spare the time. Let us examine this argument. If my memory serves, the whole of March, April, May and most of June in any one training year is devoted to small arms training, section training, platoon training, company training and equivalent small unit training. Practically four whole months for the A.B.C. of military work! And why? Because "employ" dominates the situation, because in any one month nearly

half the Regular Army are "employed" and is not available for training. Given a solution of this difficulty—and there are plenty of good suggestions available for the War Office to select from—all perfectly feasible so long as they go hand-in-hand with a *reduction and re-organization of the infantry establishment*—then there should be no reason why small arm training and small unit training could not be completed in two and a half months, thus leaving over two months available for larger unit training before the "Territorial month" commences. September, of course, would, as before, be available, if necessary, for large scale manœuvres; and if it is asked what will happen to those Regulars whose services are not required by the Territorials during August, the answer of course is, they can go on leave, a suggestion which I imagine will not meet with any great opposition from regimental officers and the rank and file. In the case of transport for Territorial Camps, an enormous sum is paid out each year for hire of all the varying forms of locomotion. It seems absurd that these sums should be squandered, when the great majority of regular transport could be loaned for nothing. And of course Regular drivers and Regular personnel could be sent to look after it, understudies only being provided from the Territorials. Having already made the unpopular suggestion of abolishing the Territorial bands, perhaps a suggestion to send Regular bands to the various Territorial camps will be regarded as mitigating the offence.

Possibly there are weighty objections to this scheme and I realize that a good many Territorials would not be enthusiastic about it. Yet on the face of it, it does seem to allow of a homogeneity of purpose and a real co-operation between all branches of our Army, Regular and Territorial; finally, it should prove an immense aid to that "war preparedness" of the Territorial Force which is so essential to the safety of the nation.

In conclusion, I would ask why it is that the strength of the Territorial units in the Northern Command is now, and always has been, so nearly up to establishment? Can there be any doubt that it is because the Northern Command has been extraordinarily fortunate in its commanders-in-chief, Baden-Powell (1908-1912), then Plumer and, since the war, Maxse and Harrington. Territorial training under these commanders has meant "training for war" and nothing else under conditions which have to a very great extent approximated to the real thing, notably at Catterick Camp.

Rational training methods, a determination to understand the Territorial's point of view, and real appreciation of his many difficulties, these have been the hall-mark of the Northern Command, and to realize the success of these methods it is only necessary to read its recruiting returns.

THE TRAINING OF SPECIALISTS IN THE TERRITORIAL ARMY

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THE training of specialists in the fighting arms of the Territorial Army has always aroused some controversy. Many authorities hold that, as the time at the disposal of the Territorial represents such a small proportion of that which is devoted to the instruction of the regular soldier, the former should spend all his drills in gaining proficiency as a thoroughly trained man of the arm to which he belongs. This means that every Territorial infantryman should aim at being a military shot as defined in "Small Arms Training," Volume II,[1] and, if he is in a Lewis gun section, a trained light automatic shot. In addition, he should be proficient in drill, in the handling of arms, and know his duties in a section when he takes the field. A corresponding degree of proficiency should be the object of training in cavalry and artillery units.

Supporters of this view consider that if these requirements are attained we shall have a competent fighting unit, which, when it has received its concentrated training on mobilization, will quickly be ready to take its place in the field. They consider that the drills are too few to admit of any real proficiency in specialist training, such as is required by machine gunners and signallers; that it is waste of time to teach the men the rudimentary knowledge they will absorb; and that it is more advantageous to train these men on the lines already stated. The machine gunners, it is also claimed, will not be required in the infantry battalion, for if another large war develops the Machine Gun Corps will be resuscitated; and it is only a large war that would require the mobilization of the Territorial Army. Again as regards signallers, the unit sections would be found from the Territorial Royal Corps of Signals, which, as signalling is their job, will be found more competent than the few badly trained men which the unit itself can provide.

The bandsmen, however, are in a different category for the majority, if not all, of them are musicians in civil life. Moreover, although classified as specialists, they form an essential part of a cavalry regiment or an infantry battalion. In peace training the band stimulates the unit's

[1] "Small Arms Training," Vol. II, Ch. 1, sec. 2.

esprit de corps, acts as a recruiting agent, and by giving performances throughout the year keeps the county alive to the fact that it possesses some share in the Territorial Army. Lastly, it is necessary for ceremonial parades, guards of honour and route marches. In war its function is to keep up the " moral " of the men when not in the fighting area. Again, when actually taking part in operations the bandsmen become stretcher bearers, a type of work very readily taught at the annual camp without interference with their band duties. They, therefore, neither require extensive specialist training, nor are they expected to be combatant soldiers.

Transport men in an infantry battalion are in a somewhat similar category to the bandsmen, being selected as far as possible from men who have to deal with horses (or motors) in civil life. Little difficulty is experienced in obtaining grooms, drivers, farriers and a saddler. Already in possession of the necessary specialist training all that they have to do is to adapt it to military routine. Then again, transport is absolutely essential, for a battalion without its transport is useless, since it has lost its mobility.

The question of personnel for such duties as cooks, pioneers, sanitary men, butcher, postman, etc., is solved in the same manner. Men are enlisted who, if they are not actually employed in the desired capacity in everyday life, have a knowledge of the work which can rapidly be augmented. The arguments given above where they refer to the band, the transport and administrative staff need no elaboration. Knowledge and technical skill acquired in everyday life does not require much extra training in order that it should fit in with military requirements.

It is, however, also stated that these duties are essential to the unit's welfare both in peace training and in war. But are not the other specialist branches equally essential to the unit's efficiency in war? And it is for war that we are trained; to be ready for war is the *raison d'être* of the Territorial Army.

Every regular cavalry regiment and infantry battalion has its machine gun unit, the importance of which has recently been emphasized by a further increase in the number of guns carried, from eight to twelve. Since our Territorial units are modelled on our regular units for a definite military purpose, surely the former cannot afford to neglect that weapon altogether? Those who state that the Territorial Army does not require special machine gun troops or platoons, do so on the grounds that in a large war the Machine Gun Corps will be resuscitated. Whether this will be the case or not we cannot foretell; even so, let us assume that this Corps will be re-formed. Then from where is the personnel for it to come? In the first instance, of course, it will be drawn from the machine gun personnel of our regular regiments. But these machine gun battalions will be required for the regular forces. When it comes to the time for the Territorial Army to take the field where will they find their supporting machine gunners? Surely the personnel will be sought

within the Territorial Army itself, just as the personnel for the original machine gun battalions was found from the regular units. This is the only solution to the problem, for no Territorial Army machine gun units exist. So it is for the benefit of each Territorial unit to make sure that its Vickers gunners are so trained that it can rely on the presence of an efficient machine gun unit for its own eventual support. If the Territorial units cannot train machine gunners in the time at their disposal, how will special machine gun corps, formed when a war is in actual progress, attain the required efficiency in a very short time unless the personnel have had some elementary training? It must therefore remain the responsibility of every Territorial unit to train its machine gunners, whether, in the event of war, a special corps is to be formed, or every unit retains its own Vickers gun formation.

Artillery formations have not to contend with the same problem of machine gunners, but they have their own automatic weapons for local protection, for, in spite of the fact that the nearest body of cavalry or infantry is required to provide an escort for any artillery which may demand it, it has been found necessary for each battery to possess some weapon of this nature.[1] Territorial artillery are thus no exception to the rule, and batteries still have to train their specialist Hotchkiss or Lewis gunners.

The necessity for a cavalry regiment, an artillery battery or an infantry battalion having its own signallers on its establishment is universally recognized. If this be necessary for the regular unit, so must it be necessary for the Territorial unit; both have the same organization, and both perform similar duties in the field. The unit signallers have the regimental *esprit de corps*, they are working for their unit and will therefore give of their best. The men know their officers, they know to whom messages are to be delivered, there is no waste of precious minutes. Time is not lost, for example, in making enquiries as to who is the officer commanding " C " Company. Or, if that officer has become a casualty, there is no doubt as to the next senior who has taken over his duty. Should this personnel be provided from outside, viz., from the Royal Corps of Signals, the personal touch, so essential to smooth working, would be lost, and signal stations might quite easily lose touch with the headquarters with which they are supposed to be operating. Besides, the Territorial Corps of Signals has enough work on hand in training and providing units for brigade and higher formations, just as its regular prototype.

Three classes of specialists have yet to be mentioned; these are scouts, police and orderlies, of whom only a few men are required for each task. Of the three, scouts would need the most training, but if the men selected for this duty have had any prolonged experience as Boy Scouts, they should already have a thorough grounding in scoutcraft. Any further training that is necessary can be carried out at the annual

[1] F.S.R., Volume II, Section 61.

camp.[1] Police and orderly duties are simple, and the training that the men thus employed receive in camp is sufficient. The same remark applies to despatch riders in a yeomanry regiment.

The various categories of specialists now being trained in Territorial fighting units have been considered, and an endeavour has been made to show the importance of their inclusion in establishments. It has to be admitted that, in the time available for training, machine gunners and signallers cannot reach a very high standard of proficiency, but even so these partially trained men form a nucleus from which to expand as soon as concentrated training commences on mobilization. If the unit is fortunate it will possess the required number in its sections, and such men will all have some definite knowledge at the start. If, on the other hand, numbers have to be made up, men already possessing a certain amount of knowledge will "infect" the newcomers. Also a percentage of those who have undergone specialist training in the past will be joining up and will be absorbed into that branch for which they already have a distinct qualification.

It is now proposed to consider the training of these two classes of specialists in detail. The suggestions put forward are illustrated by reference to signalling, but the principles apply just as much to training machine gunners. Except when actual signalling instruction is named, both categories are intended to be included. Further, although it is proposed to consider the circumstances affecting an infantry battalion, our observations should apply equally to yeomanry and artillery, the latter in so far as its light automatic weapons can constitute a secondary specialist problem.

To begin with, in selecting men to be signallers it should be remembered that very much more brain work is required in this form of employment than in any other. It is essential to find really intelligent men with nimble minds. From men taken haphazard good results cannot be expected. Electricians and others employed in the Post Office constitute the most suitable type, and on their joining up every endeavour should be made to enrol them into the signal section.

In a number of cases it is found that the signallers come from widely separated districts. This is unfortunate, because the men cannot be trained together, nor can all get the same amount of instruction. Also, some areas may be lacking in an instructor. The only way to overcome this obstacle is to recruit specialists from definite localities; the machine gunners from one town or country district, the signallers from another. This system is carried out in the majority of units when obtaining bandsmen, and, if it works for one class of specially employed men, it should work for the others. It keeps each group of a H.Q. wing together. The men can be trained on the same programme and under the same instructors; they get to know their superiors and their fellows, while it fosters a splendid *esprit de groupe*.

[1] I.T., Vol. I, Ch. x, Sec. 149.

It is recognised that a certain amount of drill is necessary in order to give men some soldierly outlook, to teach them how to carry their rifles, and to instil discipline. Specialists cannot be expected to reach the same proficiency in close order drill and rifle exercises as those men who devote all their time to that work. Therefore these drills should be reduced to an absolute minimum for specialists; flag drill does compensate to a certain degree for the loss of squad drill and rifle exercises. But guards of honour and the like should not include signallers or machine gunners, for, however much they may try, they will assuredly fall short of the general standard of the unit. Besides specialists cannot spare the time necessary for rehearsing these functions. All the time they can devote to training must be spent at their own specialist work.

The first essential is to have good and capable instructors. Each unit should have a signalling officer with two or more assistant instructors. If possible, signalling instructors should undergo the Regimental Instructors' Course at the School of Signals.[1] As this lasts about fourteen weeks, it is realised that very few men can avail themselves of the opportunity owing to such a long period of absence from civil employment. Failing this, however, there are short courses of three weeks duration at the School, which it should be possible for the majority to attend. These courses are highly concentrated and deal with the groundwork of an instructor's duties.

Signal training must be progressive and continuous. It is, therefore, of the utmost importance that a scheme of training on these lines should be drawn up and followed in every Territorial unit. All the elementary training should be done during the winter and spring drills. The annual classification can then be carried out just prior to the camping period, thus leaving the whole fortnight at camp free for schemes and tactical work. Under the system which is at present employed in a number of units the majority of signallers are not in a position to do any tactical work at all, and the whole time at camp has to be spent in doing what is known as barrack square work, i.e., flag drill, reading and sending the various instruments, lectures on procedure, map reading, and the like.

Holding classes where varying standards of proficiency are represented is practically useless. The advanced men are held back, while the beginners do not obtain any thorough groundwork. The most satisfactory method to employ is to divide the men into various classes according to their ability. Each class can then be placed under an assistant instructor who takes his men progressively, knows their capabilities and can apply his instruction accordingly. The more advanced men will soon gain proficiency, and the beginners will imbibe a thorough knowledge; no man will be held back or emerge only half-trained through skimping elementary matter. It may be necessary to have three or four

[1] Machine gun instructors will, of course, go to the Small Arms School (Netheravon Wing).

classes with only a few men in each, but the results obtained will more than repay the extra instruction involved, and there will be no waste of valuable time and effort. It should be possible for men to arrange definitely when they can come to the drill hall, so that the instructors would know that all the advanced men would be available on a certain day, the fairly advanced on another day and so on. This would allow programmes to be made out and continuity of training to be maintained.

Two important facts that require emphasizing are that signalling work is progressive and that proficiency can only be gained by constant practice. The men should therefore be made to understand that it is of little use turning up at odd moments simply to get their " drills " in. A system to work on is required, and it is obvious that men who can work to a system will be the best material from which to make signallers. A man gains little value from parades by attending for five consecutive weeks, then missing eight, following these again by another period of good attendances. Once every ten or fourteen days would be more advantageous.

In some districts it is unfortunate that signalling drill interferes with company drill. This clashing of parades should and can be avoided. Separate days or special hours may be set apart for the signallers so that they can carry on with their own work and not interfere with nor be interfered with by others. Signallers cannot work properly when relegated to a corner or shut up in a small room. If the whole hall is available during the hours of their parades, visual reading can be carried out. The flag, shutter or lamp can be situated at one end of the hall, while the readers take up their positions at the other end. When the evenings get light enough visual reading and sending can take place outside in any available open space. Naturally, this will give more satisfactory results than indoor work. Even on dark evenings night lamp reading can take place outside, bicycle lamps being used by the writers to enable them to see their pads. This night reading is not a classification subject, but it improves the men's knowledge of the morse code and increases their rate of reading. Buzzer reading and sending, practical electricity, lectures, etc., can be carried on indoors. An endeavour should also be made to do practical map reading in the country during afternoons or at week-end camps.

A form of training which is most valuable is " pair-work," but to be effective it requires proper supervision, while any open space or a fair-sized drill hall is a suitable place for parade. This work teaches reading, sending, station duties and procedure. It also gives the men confidence in themselves, in one another, and in their signalling ability. It is an easy stage from " pair work " to " station work," and from that to " schemes " when proficiency in map reading has been reached and the men have developed an eye for country. Carelessness and apathy must be checked at once, or else they will form habits fatal in the later stages of training.

Liaison between the Territorial units and their regular battalion at home can be turned to very profitable account. Arrangements can be made for the attachment of a certain number of Territorial signallers to the home battalion during the winter training season. A suitable period for this is a fortnight, during which the men would get full time instruction from a qualified regular assistant instructor under the direct supervision of the battalion's signalling officer. Without a doubt this scheme would throw a fair amount of extra work on the regular instructional staff, especially when they are busy preparing for their own classification, but it is for only a short period, and it may often be found that the regular battalion is only too willing to help its Territorial comrades. Not only the actual teaching but fraternization, the barrack life, military atmosphere and discipline will have a marked effect on the " civilian soldier." Arrangements can also be made for the visitors to be included in the games which take place, while simple competitions and matches, in work and recreation, organized. The Territorials will then go away knowing that they are now signallers of some ability, yet with the keenness to reach the same standard as that acquired by their regular opposite numbers beside whom they have been working. The most suitable time for this attachment is naturally just before the annual classification, but it will require very careful and early co-ordination and organization to bring this ideal condition to pass.[1]

The classification of the signallers should take place before the unit proceeds to its annual camp. The men are then available for applying practically the training received throughout the early part of the year, and do not spend all their days in cramming up for the test at the end of the fortnight's camp. Unfortunately this latter case is more the rule than the exception. The men do not get to realize the real value of signalling ; neither is their interest stimulated. If classification is over and done with, then during the first week of camp, when battalions are busy with platoon and company training, the signallers can be occupied with simple visual and line schemes. All that they have learnt in the past is now put to practical use, and the men recognize its significance. Then when the second week of camp comes along and battalion exercises begin, with perhaps even a brigade day, the signallers can take their place in the field and combine tactics with their theoretical work. Their actual value as means of communication during a rapidly changing situation may not amount to much, but it teaches the signallers their functions in war ; together with a practical appreciation of concealment, shelter and background. At brigade camps, owing to the small numbers of signallers present, it will be found most convenient to amalgamate all the signallers and co-ordinate their training. Consequently when battalion schemes take place all the signallers in the brigade may be

[1] This method of work, in addition to applying closely to machine gunners, also applies to transport personnel. Furthermore, it is suggested that a Territorial Transport Officer would obtain valuable experience by an attachment to a Regular Unit.

operating with one battalion ; but this is infinitely more preferable than each unit taking its own few available men. The probable result under the latter circumstances is that one battalion has from six to ten men, and wonders why battalion headquarters cannot maintain communication with all its companies. Beginners, however, should not take part in these schemes, but should continue with their " barrack square " parades. It may be possible to arrange for another classification at the end of camp for the more progressive of this class, provided, of course, that they have not been put up at the previous test.

During the past three or four years some brigades have obtained the attachment of regular officers to co-ordinate the camp training of their specialists. Regular units have lent machine gun, signalling and transport officers. The writer, who has been fortunate enough to have been employed in the capacity of Brigade Signalling Officer at Territorial Army camps during the past two years, is able to vouch for the tremendous keenness and enthusiasm shown by the men when they took their place in maintaining communication between parts of a force during field exercises.

From observations made during work with Territorial Army signallers the writer is of the opinion that in many units signalling does not receive all the attention due to it. What is true of this, the most complicated of all the infantry soldier's tasks, he believes to be true of other specialist departments. More, however, should be achieved with the available resources. Satisfactory results are to be attained by the elaboration of a progressive and sensible programme with thought given to every detail. Encouragement to take a keen interest in their work should be given to all assistant instructors, by providing them with the necessary training manuals and equipment. With training organized on sound and economic principles the Territorial Army specialist should then prove his value when his unit takes the field.

It is fully recognized that the training of these specialists in the fighting arms presents many difficulties. It is therefore with the object of attempting to assist those responsible for this training that these suggestions have been thus boldly put forward.

AIR EXERCISES, 1927

By Flight Lieutenant W. T. S. Williams, D.S.C., R.A.F. (Ret.).

IN the course of over one hundred airship and aeroplane raids over Great Britain during the late war, German aircraft dropped nearly 9,000 bombs, of a total weight of some 280 tons, on British soil. As their result 1,413 persons were killed and 3,408 others were injured, London suffering more than half the casualties.

The enemy's primary motive was to undermine the morale of the British public. He realised that the moral effect of bombing from the air and its various secondary consequences, such as the stoppage of railway traffic and reduction in the output of munitions, far outweighed the somewhat limited material damage possible. Although it may justly be claimed that the failure of the German effort to achieve any considerable moral effect was due, firstly, to the pin-prick nature of the raids themselves, and, secondly, to the success of the defensive measures which were extemporised, we cannot ignore the effect of the raids, which decreased our munition output and obliged us, in response to public demand, to retain valuable material and personnel in this country. For instance, the defence of London alone employed 14 service squadrons, 10 balloon aprons, 370 searchlights, 180 guns and some 30,000 men.

After the Armistice, our Air Defence organization was disbanded until such time as the Royal Air Force should be organised on a permanent basis. Indeed, in the immediate post-war period this country may truly be said to have been entirely defenceless from air attack in so far as a specialised organization to deal with such an attack existed. But a permanent system of air defence based on the experience gained during the European War was soon seen to be imperative, in view of the increase in range, carrying capacity, speed and general efficiency of aircraft. The constant growth in their numbers and the realization that on the outbreak of another war whole fleets of aircraft will be available for offensive purposes, emphasized this need.

That the air raids of the past are no guide to the nature of present, and still less of future, aerial attack, was emphasized in the present Air Minister's statement, made in Parliament during 1925, that :—

> "Whereas in the late war some 300 tons of bombs were dropped in this country by the Germans, air forces to-day could drop almost the same weight in the first twenty-four hours of war, and continue this scale of attack indefinitely."

This being so, and in view of the fact that the security of the United Kingdom is an essential condition of Imperial Defence as a whole, the Government, in 1923, initiated the present Air Defence programme, during the introduction of which in the House, the Secretary of State for Air used the following words :—

> " Air defence is probably the most vital of all forms of defence at the moment. I am quite satisfied as to that, because the only menace of serious note to this country, as far as I can see, is from the air."

The supreme command and organization of the unified defences was then for the first time vested in the Royal Air Force on the logical argument that anti-aircraft guns, searchlights and their subsidiaries, form the smallest portion of a co-operative system, the primary counter of which lies in the air, against an enemy whose main threat is from the same element.

Needless to say the full development of such a system on a permanent basis takes time. The full scheme allows for :—

(*a*) A defensive organization intended for the immediate and direct protection of the country itself ;

(*b*) A striking force to defend indirectly by offensive action against the enemy: this striking force is eventually to consist of thirty-five squadrons.

The defensive organization consists, in the first place, of a number of small observation posts stretching from the South and East Coasts inland, and manned by a volunteer Observer Corps, whose duties are, by observation and the use of instruments, to give an indication of the position, number, height and course of enemy aircraft. From the observation posts this information is passed to collecting stations and thence to Air Defence Headquarters. This information enables the Air Officer Commanding-in-Chief to put into operation such other sections of the defences as will best meet the situation. These will consist of squadrons of fast single-seater fighter aircraft, anti-aircraft batteries, searchlights and sound locators.

Thus described, it seems a long process, in practice it can be extraordinarily rapid, provided the intelligence obtained and transmitted be reliable.

Certain passive forms of defence, such as balloon aprons and aerial minefields will, in addition, be used during actual hostilities. The aprons consist of a large number of steel cables suspended vertically at short intervals from horizontal cables supported by " Cacquot " kite balloons.

For the immediate defence of London there is an artillery zone, encircling a fighting zone allocated to fighting units. The zones are divided into sectors. Enemy aircraft penetrating the artillery zone are engaged by single-seater fighter aircraft aided by searchlights.

During the last week in July, the first annual tactical exercises of the Air Defence of Great Britain took place. These exercises were deliberately of very limited scope and were devised solely to test the defensive measures adopted, which will not be fully developed until 1935. Hitherto its organisers have concentrated on essentials only, so that some sides of the highly complicated system have received more attention than others, and consequently as a whole it cannot be truly said to have developed to even a quarter of its ultimate extent. The area of operations extended roughly over the counties of Middlesex, Kent, Surrey, Hampshire and Wiltshire and lasted five days and five nights, two nights operations being cancelled on account of weather. In actual warfare the weather on those two nights would not have prevented operations. In spite of this, 105 raids were attempted, the majority of which succeeded in attaining their objective.

In order to work out a scheme that would test various sections of the defences and provide instructional tactical exercises, a country called " Westland " was attacked by " Eastland," and so heavily bombarded from the air that its government had been forced to retire from its capital, London, to Manchester. This portion of the idea allowed for the present incompleteness of the defences and for the fact that some of the Territorial formations were engaged on duties outside the scheme. The Eastland Commander, acquainted with the organization of the London defences, was anxious that no further units should be withdrawn to defend other parts of Westland, which he was engaged in attacking. In consequence, he detailed a portion of the forces at his disposal, some eight squadrons, to harass constantly all sectors of the London defences and keep them fully occupied. One of the objects of the operations was to ascertain to what extent the Westland Commander was able to meet these constant attacks.

For the purpose of the exercises the formations of the Air Defence of Great Britain Command were divided as follows :—

Eastland.—Eight squadrons of the Wessex Bombing Area, under the command of Air Vice-Marshal Sir John Steel.

Westland.—Eleven squadrons of the Fighting Area, under the command of Air Vice-Marshal Sir Robert Brooke-Popham, together with the Air Defence formations (T.A.), consisting of Anti-aircraft Batteries, Searchlight Companies and the Observer Corps. The latter, which manned ninety-nine observation posts, spread over the Southern and Eastern Counties, were only available during the latter half of the exercises.

The actual control of the operations varied during the week. On the first, fourth and last days the operations of both sides were controlled by the Air Officer Commanding-in-Chief, Air Marshal Sir John Salmond, whilst on the remaining days the Air Officers Commanding the Bombing and Fighting Areas conducted their own operations.

Umpires were stationed at each objective and anti-aircraft battery, at each Westland aerodrome, and in one of the machines (specially marked) of each formation of aircraft. Those in the air signalled their decisions by three methods :—

(*a*) By wireless, if available ;

(*b*) By Very Light : A red light to signify casualties in the opposing formation ; a green light to signify casualties in the umpire's formation. Each light represented a maximum of three machine casualties ;

(*c*) By Aldis Lamp : Using red and green shutters. The beam of the lamp being aimed at the leader of the formation and acknowledged by flashing a navigation light.

In assessing casualties in a combat between Fighters and Day Bombers, half the difference in strength was awarded against the smaller formation. In a combat between Fighters and Twin-engined Bombers, the strength of the latter was doubled and half the difference in strength awarded against the smaller formation. This equalised matters for certain squadrons working on a peace-time basis and employing only a small number of machines.

Machines assessed as destroyed were recorded as casualties but rejoined their squadrons for the next operation. This served the dual purpose of treating the machines as reserves and exercising the pilots throughout the operations.

At each objective two portable canvas huts were erected, one containing a wireless installation and the other a camera obscura. The powerful lens in the roof of the latter reflected on to a chart table the course of the raiding aircraft immediately overhead. By tracing this on the chart and by an elaborate timing device used in conjunction with wireless, the umpire obtained a fairly accurate knowledge as to where each bomb would have dropped. These results were further checked by graduated vertical photographs taken over the target by each attacking formation.

The following is a brief summary of each day's Operations :—

July 25th.—A continuous cloud layer at 2,000 feet at first aided the Westland Defences, but later in the morning increasing gaps in the cloud layer made bombing possible from above and seriously hampered the Fighter patrols. During the day eight raids were carried out, five of which were successful, two being intercepted and one failing on account of bad weather. It is noteworthy that the five successful raids all took place in the morning and during the afternoon no attacking squadron reached its objective without severe casualties. Much was learnt during the day regarding the influence of meteorology and cloud formations on defence measures.

Night, July 25th-26th.—Operations were cancelled by the Air Officer Commanding-in-Chief owing to bad weather. Aircraft in the air were recalled by wireless and with one exception, all returned safely to their

aerodromes. The necessity for the provision of emergency landing grounds for night operations in a climate as changeable as that of England was clearly demonstrated.

July 26th.—Weather again favoured Eastland, scattered clouds hampering the Fighter Patrols. The height of the upper cloud layer permitted bombing machines to attack their targets in some cases from 16,000 feet. Six raids were carried out, two failed on account of the bad weather, two were successful while the remaining two suffered such severe casualties from the Westland Patrols that in war they would not have reached their objective.

Night, July 26th-27th.—The night on the whole was fine and clear. About 2 a.m., however, thick weather came up from the West, necessitating the recall of aircraft still carrying out operations. These were designed to test particularly the organization of the ground observers and searchlights. The latter are mobile units consisting of lights and sound locators transported on petrol-electric lorries, which supply the necessary current during actual operations. Twenty-eight raids were carried out; of these raids sixteen were intentionally given a route approaching London through a sector lit by searchlights and patrolled by two of Westland's Fighter Squadrons. The remaining twelve raids were made to approach London from the North, the object being to prevent the illuminated area becoming unduly congested by aircraft. In this sector, the Westland patrols inflicted heavy casualties on the raiding squadrons and it is judged that few raiders, if any, would have escaped destruction, while the searchlights, operating in an area only half their war-time depth, successfully picked up and illuminated several of the raiders. The Observer Corps was used for the first time and proved of great value to the defence.

July 27th.—The weather over the area of operations was variable, intervals of sunshine being followed by local thunder and rain storms. A gusty South-West wind of 40 m.p.h. helped the attackers coming from the South and West. Twelve raids were carried out, six of which were successful, five were intercepted, while one failed owing to bad weather.

Night, July 27th-28th.—Owing to low clouds and rain over the London area, operations were cancelled by the Air Officer Commanding-in-Chief. All aircraft in the air were recalled by wireless.

July 28th.—Weather conditions, with a wind of 60 m.p.h. from the South-West, over 10,000 feet, were again favourable to Eastland. Nine raids were carried out, two were successful and bombed their objective without being intercepted, two bombed their objective, but suffered severe casualties, while two more were destroyed by Westland patrols; two failed on account of bad weather. The remaining raid reached its objective but could not attack owing to low clouds.

Night, July 28th-29th.—The weather was good until 2 a.m., when it deteriorated in the South-West owing to the advent of a Southerly wind.

Twenty-two raids were carried out, fourteen passed through the illuminated sector and were successfully attacked by Westland patrols. The remaining eight raids came from the North and East and were successful.

July 29th.—Peculiar weather conditions prevailed throughout the day. In the South-West, low clouds and rain prevented some raids from starting. Over London two layers of clouds, from 3,500 feet to 5,000 feet and from 7,000 feet to 7,500 feet, with clear gaps between the layers, rendered it difficult for the raiders to find their targets when approaching above the layers, while those below suffered severely from the anti-aircraft batteries. The cloud layers also rendered the work of the defence patrols difficult. Six raids were carried out, three of which were successful, two were intercepted and suffered heavy casualties from the Westland patrols and one was forced to abandon the attack on account of bad weather.

In view of their primary object, the Exercises were throughout always under a certain amount of control by Air Defence Headquarters, and judging them from that standpoint alone, it is difficult to draw any but the most obvious conclusions as to the results obtained, but it is satisfactory to find that much of the labour spent on organization has proved on test to have been well expended and that within its present limitations the defence system is efficient.

Several lessons, however, stand out, the first and foremost being that the best possible system of ground and air defence cannot guarantee that no enemy aircraft will penetrate those defences. But it is premature to say, as certain of the London Press frequently did state during the period of the exercises, that London had been theoretically " wiped out " by the invading force. In such a system where ground organization is complementary to air organization, the whole must co-operate to a very high degree to obtain results where the time factor is of such supreme importance.

It should be borne in mind that modern aircraft take less than some twenty minutes on an average to reach London from the coast. The time lost between the observation of approaching enemy aircraft and the application of defensive measures based on the receipt of that intelligence, known as " lag," exerts a crucial influence on the conduct of the defence. The greater the lag, the less is the value of the information, so that the defences, working entirely on Post Office telephone lines during the exercises, instead of by direct lines as would be the case during hostilities, were working under a severe handicap. This fact affects very considerably the time available for defensive aircraft awaiting orders on the ground, to attain their patrol altitude.

A tactical lesson which emerges is that fighting aircraft may be entirely wasted unless the arrangements for co-operation are such that they can be informed by the ground organization, while in the air, of

the approximate position of the enemy. A pilot flying at night is practically stone deaf and very short-sighted, but once he has seen the enemy there is a very good chance of a successful attack. It is also difficult to distinguish between friend and foe and recognition of the silhouette has, to a large extent, to be relied upon.

During the exercises, the defending fighters found that it was easier to find the enemy at night than by day, as they had simply to fly where the beams of the searchlights intersected to find their quarry. This, of course, would not apply if searchlights were blanketed by fog or thin mist. By day, on the other hand, with no anti-aircraft shell bursts as guides, the pilots had to search the sky in their particular sectors. This explains to a certain extent the higher percentage of successful day raids. This close co-operation between the defending aircraft, searchlights and sound locators is probably the true solution of night defence against enemy aircraft.

The exact value of anti-aircraft guns other than as a strong deterrent, cannot be conclusively proved. True co-operation in a tactical sense between defensive aircraft and guns was never attained during the European War, except in so far as guns were able to break up hostile formations, thus increasing the vulnerability of the enemy to aeroplane attack; and, purely negatively, by pre-arranged signals avoiding as far as possible, subjecting our patrols to gun fire.

Patrolling in a congested area is another point which will become a difficult problem in the future, as the defences develop. Defensive patrols are arranged usually at various heights so that collisions may not occur, but a concentration of searchlight beams within a reasonable distance will naturally attract all patrols in the immediate vicinity.

The machines with which the squadrons of the Fighting Area are equipped proved, during the Exercises, to be entirely out-classed by the latest type of day bomber employed by certain of the raiding squadrons, and were successful only against the slower twin-engined night bombers.

The Fighting Area is eventually to consist of seventeen squadrons, a strength far too small when it is realised that they constitute the principal air defence of the country and are not solely for the immediate defence of London.

A somewhat unexpected, and one hopes lasting, result of the first Air Exercises was that throughout their short duration the average Englishman was roused from almost complete indifference to Service aviation to take the liveliest personal interest in the measures taken to defend London, which is, owing to its geographical situation, of all the great capitals of the world, the most vulnerable to air attack.

ARMY TRAINING, 1927:

CONVERSION BY DEMONSTRATION

By Captain B. H. Liddell Hart.

IN the historical evolution of the British Army, 1927 may come to be known as the year of "Conversion by Demonstration." It was marked by certain material progress towards mechanization, but still more by a turn of the mental tide. In part this was due to a widened appreciation of the value of mechanized mobility and the power of the armoured fighting vehicle. But greater still in effect was the impression of the paralysis of ordinary forces in face of mobile armoured troops. This was aptly illustrated in the final Southern Command exercise, where the 3rd Division, even with the aid of a cavalry brigade, was virtually paralysed by the presence—the omnipresence—of the Mechanized Force. Quitting one position by daylight, it essayed a hurried bound forward, excellently conducted, but before it could reach its goal, merely nine miles distant, it was headed-off in front and struck in flank. And although only three companies of tanks were available against two-thirds of a division, there was little doubt in the umpires' minds that the division would have been broken asunder and its progress thoroughly disorganized. Peace requirements permitted it to reach sanctuary at Tilshead, whence in the dark early hours of the next morning it essayed a further six-mile bound to temporary safety on the wooded banks of the Avon. Exceptionally good leading and marching, coupled with certain delay in the pursuit, enabled it to gain this shelter, but the weary infantry had hardly reached it before they were encircled by the Mechanized Force. There they would have had to remain until night came again. And during the interval their crowded sanctuary was, and would have been continuously, a target for air fighters and bombers.

Infantry are, indeed, between the tank devil and the high sky—to vary a familiar choice of evils—for a tank-proof locality is usually a condensed and defined target for aircraft. Even if they survived the rigours of a harassed night march and the perils of a day of unrest, they could hardly hope to escape their armoured pursuers during a second night. And the experience of 8th September near Thame and 9th September on Salisbury Plain served to show both the feasibility and the terror of a tank assault in the darkness.

But to appreciate the impotence of infantry divisions it is not necessary to assess their probable losses. For if they can only scurry from bolt-hole to bolt-hole, as time and tanks permit, what influence can they exercise upon the strategic issue of a campaign? The supreme benefit of all these practical demonstrations of the power of an armoured force and the impotence of an unarmoured force is that they have rapidly consolidated and immeasurably extended the hold on military opinion arduously won by the advocates of mechanical warfare over a period of years. Where argument had ultimately slain its thousands of sceptics, demonstration has slain its tens of thousands.

That 1927 has been a year of conversion by demonstration is due to the fact that it has been a year of experiment—not merely in the inception of the Mechanized Force—with its great educative value as a means of comparison. Still more significant, perhaps, of the tidal flow was the improvization of a mechanized force during the training of the 4th Division in Kent—a force in which six-wheeled lorries were promoted to the pseudo-dignity of representing tanks and tankettes, and private motor-cars masqueraded effectively as armoured cars. Such an improvization was, indeed, a higher tribute to the progressiveness and ingenuity of the command than would have been the mere use of a proper force duly assigned to them.

But other experiments, of only indirect or no connection with tanks, contributed almost as much to the lessons of 1927 as the trial of mechanized forces. Thus the formation of a machine-gun company, on the Continental model, in the 4th (Guards) Brigade threw certain light on its value, but still more on the limitations of machine-guns, which depend on horse transport and man-handling. And the issue of dummy anti-tank machine-guns to infantry battalions proved that these were too cumbrous and immobile for men to handle, and that such weapons could only be effective on a mechanized mounting—in other words, that to counter a tank we need a tankette.

At the psychological moment, aptly gauged to the strength of the tide, came the striking address of the Chief of the Imperial General Staff to the officers of the Mechanized Force at Tidworth—setting the seal of authority upon the new doctrine of warfare. By clear and indisputable statement of the way that the machine-gun had annulled infantry attack, a nullity made still more hopeless by the intervention of air attack and mustard gas, he showed that large man-power armies were beyond resurrection, and that only by the development of armoured mobile forces could warfare be rescued from barrenness, and the art of generalship—the only hope of economy of life and money—be revived. The effect was most marked, almost electrical. Travelling through the manœuvre areas one could sense that the Army, now more than prepared, felt that here was the authoritative lead for which it was eagerly waiting.

In Oxfordshire one had already found a divisional commander, imbued with war-reality, taking steps to stop the farce, too regularly

played in these post-war days, of infantry attacks across the open against positions held by machine-guns.

The timely closure of this peace-time farce is one guarantee against the revival of another war-time tragedy. Subsequently, with the approval of the Aldershot Command, it was laid down that all columns, including advanced guards, must include armoured fighting vehicles; that no attack can normally be made without using tanks. A refreshing note of realism was sounded in the remark that "it must be remembered that a few well-placed machine-guns will completely disorganize an infantry attack, and it is considered better to employ tanks to overcome these weapons than to suffer heavy casualties. That at present we are in possession only of a small number of tanks in no way excuses us from not using these weapons correctly."

That dictum, based on wide experience and reflection, is a reversal of the doctrine current in recent years, which decreed that as tanks were few and precious they must be held in reserve and concentrated for the decisive blow in battle. It is unquestionable that this use for the decisive blow, as the great captains used their heavy cavalry, is the most valuable and the correct one in principle. But a decisive blow presupposes preliminary blows to fix and disorganize the enemy, and if no such blows can be effectual without tanks, even in the case of a mere infantry battalion attack, it is obviously absurd to hoard tanks for later use. But once we are driven to the conclusion that tanks are essential, not only for the decisive attack, but for every preliminary attack, the unanswerable deduction is surely that we have far too few tanks and far too many infantry?

If material changes are to accompany this mental change it is important to make an early diagnosis of the tactical conditions of a "mechanized" body—of troops. For this, experience of the 1927 Mechanized Force, immature as was its form, may help. One found that with the Mechanized Force itself on Salisbury Plain the first concern of the commander was with the problem of the protection of the force itself. As security is one of the fundamental principles of war, and the essential basis of all offensive action, this attitude was logical—as well as fulfilling the monumental words of Field Service Regulations: "The security of a force and of its communications is the first responsibility of a commander." Experience, however, tended to suggest that against non-mechanized forces protection from enemy interference was, on the whole, a minor problem. Fat oxen do not seek the proximity of, far less attack, a carnivorous tiger—and this tiger has a crocodile skin. Nor did the mediæval peasant advance upon the mail-clad knight. At the most he tried to intercept the knight at some defile where nature offset the knight's superiority. In few parts of the world are such convenient defiles numerous, and the difficulty of finding them when and where required is greater than that of a mechanized force in using its fluidity of movement to pass round them. Here it is worth recalling

that the Mongols, although their army was entirely composed of mobile troops, found neither the Himalayas nor the far-stretching Carpathians a barrier to their progress. For to mobile troops there is always a way round.

On the move the combined fire-power, armour, and mobility of a mechanized force give it ample security against direct interference. And even when halted at night, the revival of the laager—or, more truly, the Hussite wagenburg—creates a field fortress which no enemy would have been so rash as to attack twice. A tiger in his lair is no less unpleasant to approach than when on the prowl. Serious annoyance to such a laager could only come from long-range artillery or air bombing, and the first possibility would be discounted, the second greatly lessened, if the force laagered at a greater distance from the enemy than it did at Tidworth. A wider space, moreover, accords better with its strategic rôle and with its powers of rapid approach.

What of the danger to such a force by day from the air? Here experience fulfilled prophesy in showing that a "mechanized" force was a far more elusive and evanescent target than a man and horse-power column. Even when a check caused temporary congestion, and so created an air target, that target often dispersed again before the fighting aircraft could get off and be directed against it. Aircraft can hardly be kept aloft indefinitely in the hope of such a target. Again, it is far easier for one's own aircraft to protect a fleeting target created by a temporary check in a fast-moving column than to protect a slow-moving column which is a continuous target so long as it tries to move.

Air observers reported that, except when checked, the mechanized column "flitted" along the road in a way which attracted little attention and gave less encouragement to seekers for a feasible target. This dilution of movement would be still greater if, as is probable in future war, the force was to move on a broad front when near the enemy, and when distant adopted what may be called an "independent" method of movement, i.e., the vehicles moving independently and as fast as possible by lengthy bounds from one halting point to another. However good are drivers of vehicles in keeping formation, checks are inevitable, and these cause more wear and tear on both the machines and their drivers than a faster speed from point to point. The obvious objection is that a faster-moving force at longer intervals would occupy more road space, superficially. But it would occupy the road for less time.

Mechanization, in fact, may be a military parallel to relativity, changing accepted conceptions of time and space. Further, this "dispersed" movement would offer less target to the air between the halting-points; these, moreover, would be selected where concealment was facilitated, and defence against air attack could there be organized better than in a moving column.

From the material security of the force we pass to the more vital problem of the security of the commander's plan—for which he needs

information on which to base the plan, control during its execution, and the means to overcome the resistance to it. The tank is the offensive staple of the force, not naturally the instrument of reconnaissance. For this, the six-wheeled armoured car, now on the verge of production, appears the solution, when to the wide radius of the four-wheeled car is added the power to move off the road. The armoured vehicle is not merely able to search a wider front and more capable of penetrating the enemy's screen than are unarmoured troops, but at the worst a man looking through a slit in armour can see more than one who is forced to bury his face in the ground. The repeated attacks "in the air" and the unpressed retirements seen in this year's exercises have largely revealed the incapacity of the older arms even to obtain information beyond the bare fact that some of the enemy exist, and are firing from a certain locality.

Control is the real problem—far more than direct protection—of a mechanized force, because of its very fluidity, the distance it covers, and the speed which marks both its movements and its engagements. Early experience brought out the lessons that ciphering wireless messages was impossible, because of the time required, and that more staff officers were essential, including one whose sole duty should be to "appreciate" the enemy's situation and to direct air reconnaissance to confirm or modify his appreciation. A still more important point was brought out by the Chief of the Imperial General Staff in his dictum that, as with cavalry, the commander must be very far forward, and that the subordinate commanders must be so trained beforehand to a common habit of thought that they would reproduce in landship warfare the intuitive team work of Nelson's captains. And one was specially impressed, as well as personally glad, that he emphasized that the commander would probably have to supplement his wireless orders by the personal direction of staff officers who knew his mind, and could guide formations to the point and in the direction intended—a revival of the method of the Napoleonic expert aides-de-camp which one has for years advocated as essential, and, indeed, the only solution of control in modern mobile warfare.

If it had not been cut out of the original draft of the first post-war manuals, before official issue, much waste of effort might have been saved and the value of the training proportionately increased during the last half-dozen years.

From the problems which surround the movement of a mechanized force and its "approach" one passes to those of the attack. Here one is only concerned with the attack upon orthodox man-power forces, for the conflict of mechanized forces lies still on the borderland of imagination, although when it becomes reality the likelihood is that this conflict will be akin to naval warfare, with the land fleets operating from pivotal bases. These, however, unlike naval bases, will be capable of rapid organization and fortification, and thus could be progressively extended towards and into the heart of the hostile country.

For the defence of a normal man-power force the field-gun seems at present the only suitable weapon. True, a .5-inch anti-tank machine-gun has been developed, but even as a penetrative weapon it is far from satisfactory, for unless it can conveniently ensure that the tank is end-on or broadside its effective range is only a hundred yards. Against a foe so fleeting, capable of wide manœuvre, and concealable by smoke as the armoured fighting vehicle, the limitations of the anti-tank machine-gun are poor consolation to helpless infantry. Worst of all, it is so heavy as to be almost unmanageable. This year the production of such a weapon was assumed, and infantry battalions were issued with two weighted dummies apiece. In Southern Command they perspiringly dragged them about, but with small result, despite the restricted area in which the mechanized force usually manœuvred, and the fact that, in the apt phrase of General Burnett-Stuart, they often "bred like guinea-pigs or rabbits," to compensate their difficulty of movement. In Aldershot Command their unwieldiness led to the use of an unweighted substitute, on the assumption that such weapons would inevitably require to be moved on a mechanized mounting. One feels that assumptions were carried rather far, and that the tanks might just as well have claimed the speed and invulnerability of some futuristic model.

If, then, the field gun is still the best anti-tank weapon, this does not necessarily mean that it is adequately effective. It is well to remember, moreover, that to fire in tranquillity at two dummy tanks is vastly different from picking out individual targets, under battle conditions, from a long line of tanks which are rushing and firing at you. Naval gunnery figures showed that the difference between practice shooting and battle shooting was one of division by forty! However, this year's ameliorated umpiring rules allowed that a gun would knock out a tank at a range of 400 to 1,000 yards—within that range the tank was considered capable of knocking out the gun—in six aimed rounds provided that the gun itself was not neutralised by smoke or by fire supporting the tanks. Even on this basis the odds in future battle appear to be in favour of the tanks' attack—through the use of smoke, the use of swift manœuvre to strike at points where the enemy has only few anti-tank guns, and whither he cannot transfer them as quickly as the tanks can shift their axis of advance, the use of low-flying aircraft to accompany the tanks and attack such guns as are not enshrouded by the smoke-screen. The only defect is that this combination of several aids reproduces a complexity which has been characteristic of modern tactics, which was far less distinct in the tactics of the great captains, and which is perhaps excessive.

Hence, one would suggest a method which tends to reinstate the essential simplicity of the great military eras, and of the Mongols in particular. It is that the actual tank attack should be made by combined units—down to the company—of tanks and tankettes. The tankettes would lead, to pave the way by drawing the enemy's fire and testing

his defence. If found to be weak, they would go through it " all out," with the battle-tanks on their heels. If strong, they would halt on any suitable close-up fire-position, thus turning themselves into a screen of minute pill-boxes, stationary to ensure aimed fire, yet capable of instant change of position at need. Through this screen the tanks would sweep, and the position of every anti-tank gun which opened against them would be smothered with a thick spray of aimed machine-gun fire from the tankettes. It is difficult to imagine any gun-crew functioning effectively when this heavy spray of aimed bullets is added to the " water-hosing " fire of the onrushing tanks. Once the battle-tanks were through the first layer of anti-tank defence, the tankettes would race ahead, pass through them and repeat the process against any further layers. Thus the tank attack would be an alternating process of movement and a compound process of fire.

According to the hostile fire and the circumstances, the tankettes might either make direct for a chosen fire-position, or, like the Mongol horse-archers, race closer to the enemy before wheeling about and retiring a short distance to their covering fire-position. If the development of a tankette fast enough for this leap-frogging rôle lies still in the future, the use of two echelons of tankettes might be an effective expedient for the present The trial of such a method might also have a psychological advantage—for a demonstration with ball ammunition might do much to convince those who are still dubious of the normal irresistibility of an armoured attack upon an unarmoured force.

What then becomes of the infantry ? This summer one divisional commander was frank enough to tell his troops that we needed only a fourth of our present proportion of infantry. The infantry as constituted to-day are, by reason of their numbers and equipment, a very serious brake upon the mobility of the Army, and to compensate for this have no offensive value, and little defensive value apart from their machine-guns. For the bulk, conversion in a way which changes the form but preserves the regimental traditions must be the trend. There is, however, a real need, if in a sphere more limited than hitherto for a revived light infantry—sharpshooter skirmishers—both for acting as the landing parties of the armoured " land-fleet " and for use in mountainous regions—where, incidentally, only forces of limited size can operate.

In steering towards this goal there are, however, several shoals on which progress may go aground. The two most serious are, perhaps, the Cardwell system and the high standard of training required—both interlinked. The Home Army is at present tied to the pace of the Army in India by the compulsion of providing drafts for the vast number of infantry battalions there, and any inclination of the Indian military authorities towards progress is hampered by Indian financial and political factors. Also by the catch phrases, " the North-West Frontier " and " internal security," despite the fact that the scope of possible operations

in the Himalayas is obviously limited, and the fact that even to-day internal security is primarily maintained by armoured cars, held ready like a fire brigade, which exercise a greater moral influence than infantry, even if they do not stand guard over individual official bungalows. But, pending a change of mentality in India or the reconstruction of the Cardwell system, the independent evolution of the Home Army could be greatly facilitated by sending drafts direct from the infantry depots to India, a reform which General Maxse not only strove for but initiated after the war. It is a fact little known, but undermining the theoretical objections, that this direct drafting was actually carried out for two years in the Northern Command. It was only when General Maxse's great scheme of depot reorganization was officially approved by the War Office and extended to the Army as a whole, that this vital reform was dropped out of it—to our tribulation to-day.

The higher standard of training required for the new light infantry demands not longer service, but better use of the ample time nominally available. To-day the home battalions are often little more than superior militia, and the reason is partly the constant change-over of personnel owing to India's requirements and partly because of the drain of fatigues and semi-military employment upon the time and men available for training. Here, again, another of General Maxse's schemes offered an avenue of escape. This reform was the creation of " employment " companies to relieve the soldier under training of the time-wasting burden of barrack duties, and it is interesting to notice that reduction of the length of service has driven the French to adopt a similar course. The only infantryman of any use in modern warfare is one so highly trained in the use of cover that he can stalk machine-guns, and so highly trained as a shot that he can pick off their crews. For volume of fire infantry cannot compete with mechanized troops—it is an arresting comparison that even the small and immature mechanized force at Tidworth, which includes only one battalion of tanks, has a greater " fire-pumping " capacity than the infantry of a whole division had last year. Extreme accuracy of fire is the only justification for the rifleman, and it is thus a surprising and depressing development that, in the very year when the need for infantry sharpshooters to replace infantry " stop-butts " is being appreciated, the annual allowance of practice ammunition has been cut down from 600 rounds, which the experts who produced our present " Small Arms Training " regarded as the bare minimum essential, to 200 rounds. Surely the whole trend of to-day is that trained quality is better than untrained quantity? Have we forgotten such experiences as that at Biddulphsburg, where eighteen Boer sharpshooters held up and played havoc with two Guards' battalions? And if the main scope in future for our infantry lies in the mountains of Asia, where mutilation is often the penalty paid by an indifferent shot, the reduction in ammunition seems difficult to exp ain.

Finally, one would emphasize that the fighters on foot who remain must be light infantry, not only in training, but in equipment. One of

the marked impressions of this year's exercises was of the exhaustion, particularly in bad weather, of the infantry—which led in several cases to the premature close of an exercise—compared with the good physical condition of the mechanized troops. Yet in the final Southern Command exercise the crews of the armoured cars covered over two hundred miles, and of the tankettes about a hundred, in the twenty-four hours. If this contrast is a " physical " argument for mechanization, it is none the less an argument for clothing and equipping the infantrymen as an athlete instead of a beast of burden. Even his weapons are unnecessarily heavy. One of the most common objections to a lighter rifle is that it would lack the necessary strength. Strength for what?—largely, to stand the strain of being thrown about in drill so that it may make a resounding noise. No one would maltreat a sporting gun as we insist on the soldier's rifle being maltreated. Is there any serious reason why the infantry sharpshooter of to-morrow should not carry his light rifle in a waterproof cover? If not, the practical should surely override the picturesque.

FUNCTIONS AND FUTURE OF THE ROYAL MARINES

A PRIZE ESSAY*

By CAPTAIN E. J. WOODINGTON, R.M.

I.—DUTIES AND CHARACTERISTICS OF THE ROYAL MARINES.

* * * * *

THE operations which detachments of Royal Marines serving with the Royal Navy may be called upon to carry out can be summarized as follows :—

(*a*) In peace time, to land detachments for the preservation of British lives and interests or to carry out small punitive expeditions ;

(*b*) In war, to make use of the command of the sea by landing detachments to—

(1) Seize and hold advanced bases for the fleet ;

(2) Carry out attacks on the enemy's bases and lines of communication.

(*c*) To take part in the landing or evacuation of an army on a hostile coast, the operations of the Marine forces being restricted to the zone covered by the gunfire from the fleet.

It is no part of the Royal Marine detachments of the fleet to provide units for service with an army in the field.

Another employment of Marines is to come to the aid of the Civil Power at home and abroad in case of disturbances on land. In many unfortunate strikes of recent years Royal Marine battalions have been raised and employed on the defence or working of coal mines, Admiralty oil tanks and other essential Government property. A Royal Marine battalion was the first to be despatched on the present trouble in China becoming serious.

The Marine is a long service man serving for twelve years as a first engagement and for a further nine for his pension. During the normal course of that service he is liable to serve ashore or afloat, in large or small bodies, all over the world. Thus with his strict discipline is combined

* Owing to pressure on space the historical aspects of the subject dealt with in the original essay have had to be eliminated.—EDITOR.

a knowledge of the world. This gives him a great confidence in himself and a great *savoir faire*. He is able to forage better for himself than his comrades in the Army when sent abroad for the purpose of policing the world.

II.—Their Organization and Training.

1. *Role of the Corps.*

In a recent article dealing with the future of the Corps, the following words occur :—" No two Royal Marine officers gave the same answers to the two simple questions. To what Service do you belong ? What is your Corps for ? "[1] To the first question there can be only one possible answer. To the Royal Navy, by whom and for whom we are raised and paid. That any other answer could have been given shows that an insufficient appreciation of the rôle of the Corps exists even in the Corps itself. We have endeavoured to answer the second question in the first part of this paper.

Unless the Corps is trained for these purposes, it can have no *raison d'être* and would also lose its unique character. The same author also states " they must be trained, as regards the actual fighting, by the Service under whose aegis they will fight." " The War Office must take over the Marines as a definite part of the Army."[2] Surely this is placing the cart before the horse. The Service under whose aegis they will fight is the Royal Navy, to which they belong. By placing them under the Army we revert to the unsatisfactory state of affairs which caused them to be raised. It is essential that the Navy control the Services which are to fight for her. As pointed out by another author in the same journal, the present controversy over the Fleet Air Arm gives an indication of what might happen were the Corps placed under the War Office.[3]

If the War Office were to take over the Royal Marines they would cease to exist and revert to be a regiment of the line, merely earmarked for service with the Navy.

On the other hand, if they are to be the military specialists of the Navy, they must be trained by the military service with whom they may be required to co-operate. This is the case at present. The officers under whom the Corps is trained receive their own training at various Army schools, notably the Senior Officers' School and the Small Arms School, Hythe. Subalterns and captains are required to take the Army examinations for promotion.

Unless the Corps is prepared to acknowledge that it is part of the Royal Navy, the best results cannot be obtained. Fortunately the days

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[1] " The Future of the Royal Marines," by Major M. Everett, D.S.O., R.E., Journal of the Royal United Service Institution, Vol. LXXI, page 693.

[2] *Ibid*, page 697.

[3] " The Future of the Royal Marines "—A Reply—by " Classiarius." *Ibid*, Vol. LXII, page 56.

when ill-feeling existed between the Corps and the Navy have practically passed away, and with a little give and take on both sides there is no reason why the Corps should not be firmly established in its old honourable position of a highly trained and efficient branch of the Navy. There are, however certain facts of organization which militate against this.

Firstly, in the majority of cases officers do not serve at sea for very long after they have obtained their majority. No officer should hold an appointment at the Royal Marine Office unless he has held the position of Squadron Royal Marine Officer or Fleet Royal Marine Officer. Secondly, a proportion of non-commissioned officers and men are able to avoid sea service. This possibility has a most detrimental effect on the efficiency of the Corps afloat and should be most carefully eliminated. Thirdly, the depot of Royal Marines and Royal Marine Divisions sometimes forget that, in the case of the former, they exist to train Royal Marines for the Fleet and, in the case of the latter, that they are intended for the benefit of the Corps afloat. More liaison between the staff of Divisions and officers afloat is desirable. A helping hand might more often be extended to ships, especially of the Home Fleet, when ships are at their home ports. A closer liaison between Divisions and the personnel of other branches of the Royal Navy at home ports should be maintained.

On the other side of the picture, the Corps, if it is to maintain its usefulness for the Navy, must retain its identity, peculiar customs, standard of discipline and military training. It must be given every opportunity to maintain its rôle of "military specialists." This is occasionally forgotten by officers of the Royal Navy.

2. *Employment and Training Afloat.*

(*a*) *The Striking Force.*—The Royal Navy must acknowledge that the first use of the Royal Marines is as its striking force, and its employment as such must be the chief factor governing its employment afloat. When Royal Marine detachments are required for military training all other considerations must give way. That this is acknowledged by higher authorities may be shown by the following extracts from the Regulations.

> "The exercises should frequently take the form, when opportunity offers, of practising a landing in the face of opposition from a hostile force, with guns, stores, etc., followed by such tactical exercises as are likely to be undertaken when the landing is accomplished."[1]
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> "Instruction in landing on and embarking from an open beach is to be practised throughout the year as well as during this (field training) course."[2]

[1] The King's Regulations and Admiralty Instructions, Article 773(4).

[2] *Ibid*, Article 773(10) (f).

In the Atlantic and Mediterranean Fleets operations have been carried out during the last year in exercising the striking force available from the Fleet : in both cases with most interesting and valuable results. In the article already quoted the following is suggested as one of the advantages of re-organization. " Their training to act as formed battalions would be made much easier."[1] One of the most difficult and interesting problems dealt with in our recent exercises was the concentration of the forces available in the ships from which they were to land and their landing on the beach. This required most careful organization, since the whole force could not reasonably be collected in one ship. An essential part of the training must, therefore, be this concentration under conditions as they exist in war. Marines must be trained to act as battalions which are *not* formed, until land is reached.

It is felt, however, that there is a tendency to regard these operations as sufficient and that individual detachments are not given sufficient practice in landing operations as indicated in the order quoted above. More co-operation with the seaman branch is also required for this operation. In the operation referred to in the case of the Atlantic Fleet, it was found that the seaman personnel required considerably more practice in the handling of tows and in co-operation on arrival on the beach.

Every opportunity should be taken to carry out preliminary training for the striking force. Tactical exercises without troops and sand-table exercises should be organized by Senior Officers afloat for their subordinates. Problems to be solved being such as will be met in landing operations. Similar exercises can easily be organized for the non-commissioned officers. Platoons from detachments and even sections must be taught the principles involved in embarking in an open boat, slipping in tow, landing on the beach, re-embarking under fire. This must be in addition to ordinary tactical instruction in the operation likely to occur subsequently to the landing and the training of the men in the handling of their arms by frequent bayonet training and small arms training. In this respect it must be remembered that whilst the Army Manuals form the authority for training, the peculiar nature of the services required of the Corps must be borne in mind and the books must not be slavishly adhered to when their application obviously does not meet the problem to be solved.

The organization and training of the striking force must also be considered when embarking the Royal Marine personnel for ships. The present system of embarking officers and men to ships in accordance with gunnery requirements must cease. The officers and detachments must be based on striking force requirements first, the number of personnel required for the guns being considered later. Thus, in embarking officers in fleets and squadrons, attention must be paid to the requirements of

[1] " The Future of the Royal Marines," by Major M. Everett, D.S.O., R.E., *p.s.c.*, JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION, Vol. LXXI, page 698.

the striking force available, bearing in mind the number of officers who can be accommodated, particular attention being paid to the specialist officers. A large fleet should contain: an officer passed for adjutant, an officer qualified in signals, three officers qualified in machine guns, an officer qualified as a small arms instructor and one officer with a knowledge of transport for each battalion available. The embarkation of specialist officers as such would also encourage junior officers to qualify in these subjects and establish the principle that shore establishments are not the only places of employment for specialists.

The specialist officers, besides finding their employment in battalions when formed, would be available for instruction of specialist other ranks and for the issue of training memoranda. In the case of other ranks the requisite number of specialist ranks for battalion, wing, and company headquarters, according to the number of battalions or companies available, must be considered. The complements of ships should then be made up on a section basis, allowing sufficient complete sections to form the gunnery and other duties required.

Another most important point in training arises, especially in the training of the ordinary platoons. Officers and men must not be changed so frequently as now often occurs. Nothing can be so disheartening to officers afloat than constant changes of themselves or their men. An officer finds himself in command of a platoon afloat and commences to train them, a long and difficult task with the training hours available; then, just as the results of his labours are appearing, either he is moved or half his platoon is taken away. It is felt that some re-organization of the drafting departments by which this constant movement can be checked should not present an insurmountable difficulty.

(*b*) *Other Training and Employment Afloat.*—Besides acting as a striking force the Royal Marines afloat should be regarded by the Royal Navy as instructors in military duties. Every day ships become more complicated and naval officers have more to learn. Specialization in the Royal Navy increases. Surely the gunnery personnel could have no objection to turning over to the Royal Marines the training of their men in such military knowledge as they require, thus freeing themselves to study seamanship and gunnery.

That they are to be regarded as military specialists is shown by the following definitions in the Regulations regarding their duties afloat. "Specialists in land warfare." "Instructors in Lewis and Vickers Machine guns, bayonet and physical training and grenade training."[1] At present they are not sufficiently so employed. Possibly as a result of former times it is not realized how well trained in the military art the Royal Marines now are. To support their striking force the seamen must have a rough grounding in infantry tactics. The Royal Marines should be employed to give this grounding.

[1] King's Regulations and Admiralty Instructions, Article 747(2) & (4) (c).

Another aspect of the same question arises with regard to close order and ceremonial drill. In recent years their reputation in this respect has been unsurpassed. The latest example being the words of His Majesty The King, the Colonel-in-Chief, to the officer commanding the King's Squad at the Royal Tournament this year: "Tell your boys that their King is very proud of them."[1] Why, then, cannot the Royal Navy regard them as their representatives at ceremonial drill? Aboard they provide the ordinary ship's guard, parade for "Colours," and as guards for receiving distinguished personages. As soon, however, as a special guard is required ashore, a seaman guard is provided, possibly with a Royal Marine guard as well, sometimes without. This is felt to be wrong. Firstly, because when the Royal Navy have specialists in ceremonial drill they should use them as such. Secondly, because an ever-increasing tendency to turn the seamen into Marines is having a detrimental effect on the seamanship of the Royal Navy. Seamanlike evolutions, sailing and boatwork, should be the ceremonial of the seaman. The reason why the Royal Marines are not employed by the Royal Navy for ceremonial on all occasions, is felt to be due, in a great extent to the idea prevalent amongst certain officers during the half century before the War that the Royal Marines were not part of the Royal Navy. The result was that the Royal Navy felt they must provide their own guard. If only it could be realized on both sides that the Royal Marines are a definite branch of the Royal Navy, it is believed that the latter would be more inclined to use that branch to represent them in ceremonies of a military character. Again it must be pointed out that army drill should not be slavishly followed. Opportunities for training the Royal Marine in infantry drill, once he has left the depôt, are all too few, and it cannot be seen why every time minute alterations are made in the Army manual they should necessarily be followed by the Corps.

Although they are essentially part of the Royal Navy, that service cannot derive full benefit from their services unless their special *esprit de corps* and discipline are maintained.

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Much can be done on board to encourage *esprit de corps*. The men should be addressed as Royal Marines, the Corps crest should be conspicuous in their "barracks" and turrets, brief instruction in their traditions and reputation should be given, "memorable dates" should be posted in fleet or squadron orders, the guard should always be marched to or from "Colours" to the Regimental March. The Regimental March should also be played on the completion of a march from the drill ground ashore. They must at all times be encouraged to take the greatest pride in their personal appearance. The introduction of the full-dress tunic has done much towards this. The present issue of khaki drill of various patterns, shades and fittings, can hardly be said to have had the same effect. It is felt that this is an excellent working

[1] "Globe and Laurel," Editorial, June, 1927.

dress and it is essential that it should be available for service. But the appearance of the men and their pride in themselves would be greatly increased if fine white duck was reverted to for full-dress and undress in hot climates.

The modern ship has very little accommodation for the personnel required, and, every officer and man must, therefore, have more than one rôle. The modern Marine cannot expect to be a soldier and nothing more. His second rôle is gunnery, since it cannot be intended that a striking force landed from ships should remain ashore for long periods. Once the advanced base has been seized, the enemy's lines of communication cut, his base destroyed, or our own force landed or re-embarked, they must return to their ships. In any of the operations mentioned the full gun-power of the ships need not be required. There are, therefore, two aspects of the problem :—

(1) The Royal Navy engaged in amphibious operations in which she need not require her full gun power, but does require a striking force : as, for instance, during the War of 1914-19, the earlier phases of the Gallipoli campaign and the action at Zeebrugge.

(2) Purely maritime war in which the striking force is not required and the Corps afloat is, therefore, available to man the guns, as in the case of the Grand Fleet in the Great War.

Finally, ships must be kept clean and it is only reasonable that the Royal Marines should do their share. As they have the privilege of living next to the officers, the present system of cleaning that part of the ship nearest the officers' quarters appears the most suitable. This must be regarded as part of the Royal Marine department and all orders relative to them must be issued through the Royal Marine Officer. They must, also, take their fair share in the ordinary working parties of the ship, but any tendency to use them instead of seamen must at all times be avoided.

The question of the employment of senior officers will now be considered. It has been already stated that one of the factors which militate against the useful employment of the Corps is the lack of sea employment of Senior Officers. The following suggestions are, therefore, put forward. In a large fleet the duties of the Fleet Royal Marine Officer should be carried out by an officer of the rank of Colonel-on-the-Staff. This Officer should be appointed to the Admiral's staff only, and not as at present " and as Fleet Royal Marine Officer." His duties would be those ordinarily performed by the Fleet Royal Marine Officer and also to act as the Commander-in-Chief's military adviser. If available, this Officer should have graduated at both staff colleges and undergone a course at the Imperial Defence College. In smaller Fleets the Fleet Royal Marine Officer should be a junior Lieutenant-Colonel, employed in a similar way and, if possible, with similar qualifications. Such officers should not command a striking force but remain on the Admiral's

Staff. The embarkation of these senior officers would have two advantages: (*a*) A better representation in the Fleet of the Corps' point of view, especially necessary under the present scheme of relative seniority; (*b*) Officers about to take command of divisions ashore or appointments as Lieutenant-Colonels at Divisions would go to these appointments with a fresh idea of the progress of the Corps afloat.

In larger fleets a Lieutenant-Colonel should be embarked in the Vice-Admiral's Flagship and in other fleets a senior Major in the next senior ship. These officers would command the striking force when formed and also carry out the duties of Chief Instructor afloat.

Squadron Royal Marine Officers should also be appointed to the staff of Admirals Commanding Squadrons and not "and as Squadron Royal Marine Officer." The command of a Flagship's detachment, with full powers of punishment, must be invested in a captain, Royal Marines.

In the case of stations where there is only a squadron, the leading Royal Marine Officer might be a major as the Commander-in-Chief's military adviser; the command of the striking force being invested in the next senior Royal Marine Officer of whatever rank he be.

3. *Employment and Training Ashore.*

The present system of employment and training ashore, appears adequate. It must, however, be clearly borne in mind that the employment and training of Royal Marines ashore has one object and one only, namely, to fit officers and men to take their places in the fleet.

If training battalions could be established at Divisions this would undoubtedly increase efficiency. It should be borne in mind, however, that, provided facilities are given by the Royal Navy, the ideal training ground for the Marine after his first preliminary training is afloat, nearer the conditions from which the striking force will work.

The following suggestions are made for improving our present training:—

(*a*) *Officers.*—The establishment of the military class at Deal has enabled officers whose military training was curtailed during the war to acquire a sound knowledge of military subjects. It seems highly desirable that, besides being used for the instruction of junior officers, classes of revision for officers of major's, captain's and senior subaltern's rank should be organized, in order that officers may be kept up-to-date.

Instruction in the class should be confined to the study of forces of a size likely to be met with in striking force operations and a thorough study should be made of the problems which will occur in such operations. The one criticism that may be urged against the military class attended by the writer is that not once were the officers given a scheme which included the landing from a cutter of a platoon on an open beach. This operation was carried out by the recruits, field training squad, but officers were never taken to see it.

Every advantage should be taken of the facilities offered by Army schools for officers, Royal Marines, to qualify. These Officers can then impart the latest ideas of those schools to the Corps, both ashore and afloat.

(*b*) *Non-Commissioned Officers.*—It would be a great advantage if a military class of non-commissioned officers on similar, but less advanced, lines to the Officers' Class at Deal could be established at each division, great attention being paid to the problems of the striking force.

(*c*) *Other Ranks.*—There is still a tendency in the Corps for Divisions to differ in minor points of training. This does not tend to efficiency. Since the recruit is given his initial training at the Depot, it is suggested that the Depot should set a Corps standard in such points as drill, laying out of kits, assembling and wearing of equipment, arrangement of barrack rooms and details of uniform, any alterations to be submitted by the Depot to the Royal Marine Office for issue in General Orders, if approved.

4. *The Improvement of Personnel.*

(*a*) *Officers.*—If the officers of the Corps are to be efficient as such, they must possess a sound knowledge of military subjects. They must also have a wide experience of the sea service. Appointments ashore must not be held consecutively. All officers must put in their sea service in His Majesty's Ships. The only shore appointments which should be held by the officers of the Corps should be those at the Depot or Divisions or at the Admiralty. The latter ensure liaison between the Corps and the Admiralty, but should be of short duration only. The appointments of officers to posts on the Ordnance Committee or to Territorial adjutancies should be considered as definitely detrimental to their efficiency as Royal Marines. It cannot be seen that any benefit is derived by the Corps from employment of this description. Sufficient Army experience can be gained at the Army Schools or by instruction in the Corps by Officers who have been to them. The present system of seconding officers to the Army for long periods should cease. They may gain valuable knowledge as soldiers, but they cease to be Marines.

(*b*) *Non-Commissioned Officers.*—The non-commissioned officers are the backbone of any Corps. Their training and efficiency is therefore of vital importance. The efficiency of some non-commissioned officers at present is mitigated by the following facts :—

(*i.*) Certain non-commissioned officers spend too long in barracks, in staff appointments and offices, with the result that when they do come to sea as non-commissioned officers of a detachment they have no idea of the organization, duties or difficulties of the Corps afloat ;

(*ii.*) Others spend too long afloat, being sent from ship to ship, and, having had no opportunity of revising their military knowledge, are unable either to instruct their platoons or sections or to command them in the field. Definite examples of such a state are known to exist. All

non-commissioned officers must take their fair share of sea time, giving others a chance to revise their drill in barracks;

(*iii.*) Unsuitable men are allowed to come up for promotion, or are not removed when found to be unsuitable. Promotion in the Corps at the present time is slow and there is no need of a great number of candidates, many of whom are unlikely to become successful as non-commissioned officers. It is grossly unfair to keen and able men that their advancement should be retarded by the promotion of inferior men. Poor candidates must be removed to make way for those of ability. Officers in making their recommendations must harden their hearts and follow the principle of the survival of the fittest.

(*c*) *General.*—Two questions of very serious import arise:—

(*i.*) The employment of artillery specialists. The striking force on a large scale will undoubtedly require artillery assistance ashore. Training in this respect is now being carried out at the Portsmouth Division. The amalgamation of the Corps removed a healthy rivalry between its two branches and deprived the Royal Marine Artillery, the shore artillery of the Corps, of its *esprit de corps* and traditions. Possibly the suggestion of the revival of the Royal Marine Artillery may be regarded as too great a departure from Admiralty policy; the matter is therefore only mentioned in passing. It is considered, however, that their revival would benefit the Corps.

(*ii.*) The employment of clerks. The Royal Navy have their own clerks in the Accountant Branch. The Royal Marines employ ordinary members of the Corps on this duty. These men are therefore supposed to be trained Royal Marines capable of performing their duties afloat and as soldiers. They frequently pass from one employment as clerk to another. As a result they lose their efficiency as Marines. It is therefore suggested that a special branch of clerks should be formed in the Corps. Such ranks to be dressed as Marines and under the ordinary discipline of the barracks, but always employed as clerks and receiving their promotion in that branch. It may be argued against this scheme that certain appointments, e.g., of Superintending Clerk, will then be closed to the ordinary non-commissioned officer. But it is claimed that their chances of selection are already so small, unless their service has been spent almost entirely in offices, that the only effect of this change would be to establish what is already a *fait accompli* as a definite custom. Any danger of a non-commissioned officer or Marine who has spent several years as a clerk being suddenly appointed as a non-commissioned officer or marine in a ship or battalion would in this manner be avoided. It is suggested that the new branch should only be employed in Brigade, Paymaster's, Quarter-Master's and Barrack Offices; Orderly room and instructional office staffs remaining as at present. It is not proposed that men should be entered into the Corps specially for this branch, but that men who take up these appointments and prove suitable should

then be appointed to the branch. They would in this way have a grounding in the ordinary customs and discipline of the Royal Marines.

5. *Some Suggestions for an Increase in the Establishment of the Corps.*

If the various suggestions put forward in this paper are to be successfully introduced, an increase in the establishment of the Corps is necessary. The strength of the Corps at the moment is reduced to an absolute minimum. In spite of this at the first sign of trouble in any part of the globe a Royal Marine Battalion is raised and despatched. This would appear to indicate that their essential usefulness in dealing with disturbances of all sorts, at home and abroad, is greatly appreciated. Is it not, therefore, possible to increase the establishment of the Corps sufficiently to enable it to perform these duties without its functions afloat being handicapped?

One of the writers before quoted makes the following suggestion :— " It is for consideration whether . . . it is not desirable that the spear head, viz., the regular Division and the Colonial Garrisons, should not be Marines under Admiralty control for small wars."[1] This is indeed ambitious; yet, on a lesser scale, it seems peculiar that Naval Bases such as Malta, Singapore and Hong Kong should not be garrisoned by the Navy's soldiers. These suggestions, however, cannot be regarded as within the present system of Imperial Defence. Whilst thoroughly agreeing with them, the writer would put forward a more moderate suggestion, namely, that the establishment of the Corps should be increased to allow of a full battalion being stationed at each Headquarters, in addition to the establishment of personnel required afloat. In peace such battalions would be available for all kinds of emergencies without disturbing the normal drafting arrangement to His Majesty's Ships, and also could be used as training battalions. The formation of such battalions will also open up more opportunities for employment of field officers, warrant officers and non-commissioned officers. In war they would be available for the holding of naval bases after they had been seized by the striking force.

If such battalions were authorized one great danger would have to be guarded against, namely, the employment of some officers and other ranks continually in these battalions, whilst others serve continually afloat. The organization should be elastic. Portions of the battalion, preferably complete companies or platoons, must be frequently embarked as detachments for His Majesty's Ships, their place in the battalion being taken by the disembarked detachments. If carefully organized this system would also allow officers to serve longer with their men.

Another necessary small increase would be the placing of a small reserve at each foreign Naval Base. Ships' complements are only just

[1] " The Future of the Royal Marines—A Reply," by " Classiarius." JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION, Vol. LXXII, page 58.

sufficient for the forming of the striking force, and, in the case of small ships, are barely sufficient to carry out their ship's duties. Much inconvenience is thus caused by detachments being depleted by sickness and other causes and having to wait for reliefs being drafted from home.

As regards training afloat. In a big ship's detachment one or two sections can be taken for drill or instruction without much inconvenience. This is not the case, however, in small ships. It is therefore suggested that the detachments embarked in cruisers and depot ships should carry one extra section in addition to those required for ship's work. This particularly applies to ships with reduced complements, where there would be ample accommodation for the extra section of Royal Marines. Legislation would be required to ensure that, by means of this facility, more training should be carried out and to prevent these sections being used to relieve the seamen from extra duties.

It is realized that the number of officers carried afloat is not sufficient to officer striking force battalions or companies according to an Army standard. Owing to the lack of accommodation in ships this cannot well be altered. It must therefore be realized that the majority of platoons must be commanded by non-commissioned officers. This is all to the good if non-commissioned officers are carefully selected and trained.

III.—Conclusion.

The modern rôle of the Royal Marines is firstly that of a striking force for the Royal Navy and, secondly, in the words of Mr. Rudyard Kipling :—" All over the world, a doin' all kinds of things." It cannot perform that role unless it remains an essential part of the Royal Navy. In that Service the Corps must be given full scope to act as " military specialists " and allowed to retain its own unique character.

THE CARDWELL SYSTEM AND THE ROYAL MARINES

By General Sir H. E. Blumberg, K.C.B., R.M.

IN the August number of the Journal the question was raised as to whether, under modern conditions, the Cardwell system can continue to render the valuable services which it has hitherto performed. It is alleged that disturbing factors have been arising which must interfere with the smooth working of the system. Further, it is urged that the abolition of both Special Reserve and Militia Battalions, together with the non-existence of the Depot Battalions—as proposed by Cardwell—has left the Regular Battalions without means of maintenance or expansion; this is due to the fact that the Territorial Army is organized in Divisions that are subject to peculiar conditions of service, while its constitution prevents its providing for the upkeep of the Regular Battalions, particularly in the case of small wars.

The author further suggests the creation of Groups or Regiments, each of which should maintain a given number of battalions. Without accepting or rejecting this theory, it may be of interest to consider what may have been done in this direction elsewhere.

The problem seems to resolve itself into one of setting up a draft-finding organization that may:—

(*i*) Keep the battalions of the Expeditionary Force and the overseas garrisons up to strength both in peace and war;

(*ii*) Be capable of providing, mobilising and drafting reserves and recruits;

(*iii*) Admit of the battalions of the Expeditionary Force being armed and trained differently to battalions stationed overseas, if necessary;

(*iv*) Provide additional battalions as required for expansion in case of a great war.

Let us, therefore, turn to historical records and practical experience and ascertain if there is any organization in existence which has stood such a test and which may be capable of fulfilling the requirements.

It is submitted that the Corps of Royal Marines, which has been in existence for nearly 300 years, affords such an example; a corps which has come successfully through the numerous wars in which the country

has been engaged and met all requirements even in the recent Great War (see Table on page 773.)

The following resumé of the Royal Marine organization will illustrate its working. The Royal Marine Corps, apart from the Headquarter Staff in London, consists of a Recruit Depot located at Deal, and at three Divisional Headquarters, one each at Chatham, Portsmouth and Plymouth. The Depot Staff consists of trained instructors with the administrative details necessary to enable recruit training to be carried on without interruption.

Each Marine Headquarters is commanded by a Colonel with the necessary training and administrative staff, who complete the recruits' training, revise the trained soldiers, and draft them, as necessary; they also train the specialists, keep up all needful records and clothe all N.C.O's and men, no matter where serving. N.C.O's and men are attached to their headquarters throughout their service, both active and reserve, and after each period of service afloat or in shore battalions abroad, return to their own headquarters, which are in fact the men's homes, since the wives and children of the married Marines remain in the neighbourhood of their Depot.

The headquarters are also the record, mobilising and drafting centres for the reservists and pensioners who are attached to them. Arms and clothing are there stored for them and all annual training is carried out at that place.

Training.—On enlistment a recruit is sent to the Depot for training, which lasts about eight months. This comprises recruit drill, recruits' musketry, physical and bayonet training, elementary field training and swimming. He attends school until he obtains a Third Class Certificate and on passing out he is fit to take his place in a company. Squads consist of about fifty men, and on completion of training the recruits are drafted to one of the headquarters. As far as possible, they are allowed to select their own Division.

At headquarters, recruits are trained in naval gunnery, trained soldiers' musketry and company field training; they are then available for draft. On return from service afloat or overseas all ranks undergo revising courses and specialist courses, which comprise instruction for naval gunlayers, naval and army signallers, Lewis and Vickers gunners, land artillery, N.C.O's promotion courses, etc., so that detachments abroad can be supplied with fully trained men and up-to-date specialists.

Drafting.—For purposes of drafting all ships of the Royal Navy and establishments abroad are affiliated to one of the three Home Ports whence reliefs of officers and men are carried out on recommissioning of ships, as vacancies occur, or in case of establishments abroad a proportion is relieved each year, the principle being that all detachments are always kept at full strength.

Rosters are kept at each headquarters for each rank and specialist ratings and N.C.O's and men are drafted from these rosters. As far as possible men are given alternate periods of home (i.e., fleet in home waters) and foreign service. Officers' rosters are kept in London and are general for each rank. All ranks are drafted as required and on completion of the prescribed periods of service (2 to 3 years) they return to headquarters for furlough and revising courses. N.C.O's and men are always drafted to the ships or establishments affiliated to their own home port, but officers are drafted as required in their turn.

Royal Marine Headquarters also provide complete battalions, and even brigades, as and when required, as for instance, during the Peninsular War, American War of Independence, North America, 1812-14, China, 1847, 1857-60, 1927, Crimea, 1854-55, Japan 1869-74, Egypt and Soudan, 1882-85, Great War, 1914-19, Turkey, 1921, Ireland, 1840, 1882, 1916, 1920. Recent experience has shown that these battalions can be mobilised and embarked before those of the Expeditionary Force of the Army.

Finally, as in any proposed re-organization of the Army, the cry of *esprit de corps* and tradition is at once raised, it will hardly be denied that the *esprit de corps* and traditions of the Royal Marines are second to none in British history.

Bearing in mind the foregoing facts, let us examine whether it is possible to apply these principles to evolve a scheme which would place the battalions of the Expeditionary Force on a footing of readiness, while freeing them from the necessity of providing drafts for overseas, and at the same time providing an organization for the maintenance of the overseas garrisons and Expeditionary Force both in peace and war.

Let us preface these suggestions by stating that the period of service in the Royal Marines is twelve years with the Colours, with the option of re-engaging for nine years to obtain a pension. After twelve years' service, men can enrol in the Royal Fleet Reserve to complete twenty years; and after twenty-one years for service up to 55 years of age, in the Reserve.

Next let us recall certain facts affecting the Army:—

(i) *Recruit Training.*—After the Great War an enquiry into the system of Depot training was initiated by the General Staff. That report spoke so highly of the methods adopted by the Guards', Rifle, and Royal Marine Depots, that considerable modifications were made in the infantry depot courses, the time being lengthened and field training instruction being added; arrangements were also made for larger squads and, in fact, some amalgamation of the Infantry Depots was suggested, it is believed, but was not proceeded with. Recently the large Depot has been adopted by the Royal Artillery, a Central Depot being formed at Woolwich. The Royal Engineers have always had their Training Battalion at Chatham. The Cavalry had a Depot at Canterbury, but

this has recently been abolished on the p'ea of economy. As all who have had to deal with the training of recruits well know, training with service units can only be carried out in a wasteful and inefficient manner.

(ii) *Strength.*—Some few years before the Great War the Royal Artillery and Royal Engineers recognised the wastefulness of rel'eving stations by whole companies, and certain companies were localised in overseas garrisons, while the strengths were fixed to suit the needs of the garrisons, and, as in the Royal Marines, reliefs of officers and men were effected from the home centres such as Dover, Portsmouth and elsewhere.

It is admitted that infantry strengths overseas are governed by the strength of battalions, though the garrisons may require less or slightly more infantry. So we see battalions broken up between places as far apart as Bermuda and Jamaica, while in others there may be a surplus of battalions. This is necessitated by the Cardwell system; under the Royal Marine system the numbers would be proportionate to the local requirements.

(iii) *Mobilising Reserves and Providing Drafts in War.*—Now that the Special Reserve battalions have been swept away, it is clear that some new organization will have to be provided, because the Territorials, as at present organized, cannot perform this duty. It seems, therefore, as though the Depot Battalion of the Cardwell system must be called into existence for the maintenance of the battalions in the field. If these be formed in the rush of mobilization, since the personnel for such battalions can only be taken from the already overstrained staff of the existing Depots, which will be busy receiving recruits and reserves. Moreover, it is most desirable that recruits under training should be kept separate from returned invalids, wounded, and other such details.

It has been suggested in the article under review that a Corps of Infantry Officers should be formed. The writer can hardly have considered the dimensions of such a list, and the well-known fact that big lists lead to stagnation of promotion and add to the difficulties of selecting officers both for promotion and staff duties. A list thus formed would comprise more than 400 to 500 officers, and so would be very unwieldy.

The following scheme, embodying all Royal Marine principles with the above, is put forward as one way of solving the problem, provided that vested interests can be reconciled.

(1.) The Infantry to be re-organized into seventeen regiments, each consisting of a regimental headquarters, depot, and eight battalions.

Such an organization might consist of the following regiments :—

1. Guards (10 Bns.)	5. Northern	9. East Anglian	13. Shires
2. Rifles	6. Lancashire, W.	10. N. Midland	14. Southern
3. Highland	7. Lancashire, E.	11. S. Midland	15. Wessex
4. Lowland	8. Yorkshire	12. Welsh	16. London
			17. N Irish.

In fact, it might follow more or less closely our existing Territorial Army areas.

(2.) The depot, regimental headquarters and the home service battalion to be stationed in the Regimental District.

(3.) The regimental headquarters to be commanded by a colonel, with suitable training and administrative staff, and to comprise the record office, drafting and mobilising centre, and, if possible, the pay centre (if our war system can be continued).

One battalion, the home service unit, to be stationed at headquarters to receive drafts, train specialists, and receive recruits for draft and, if necessary, for completion of training.

(4.) Each regiment to allot :—

(*i*) Two or three battalions to the Expeditionary Force[1] ; the Guards, six battalions ;

(*ii*) Two or three battalions to India (Guards nil).

(*iii*) Egypt, Malta, Gibraltar, Rhine, etc., to be equally divided between regiments.

Battalions in categories (*i*) and (*ii*) to be kept at permanent strength of, say, 800, those in (*iii*) to be fixed at the strength required for the garrison.

5. Battalions to be localised in each employ, similarly to the old Garrison Artillery companies, reliefs being effected by drafting officers and men as required ; one-quarter strength to be relieved each year.

6. Periods of service to be two years in a battalion of the Expeditionary Force, three or four on foreign service. Officers and men would return in each case to the regimental headquarters and home service battalion for furlough and re-draft.

Rosters to be kept at regimental headquarters from which officers and men should be drafted, a proportion of recruits being included in each draft.

7. Officers to be on one regimental list, and to be promoted to higher rank in vacancies, and posted to battalions on promotion or on return from seconded lists as required. Selection for command being made from the major's list.

It is claimed that :—

(*a*) This system has worked satisfactorily in the Royal Navy, Royal Artillery and Royal Marines for many years ;

(*b*) Seventeen large depots, on the lines of the Guards' depot, will be more efficient and economical for training recruits than the present sixty-five small depots dealing with very small numbers of recruits ;

[1] It has been assumed that the strength of the Expeditionary Force is four Divisions, the 5th and 6th Divisions being formed from the home service battalions on mobilization and the regimental headquarters becoming the draft finding unit and mobilising additional battalions as reserve officers and men become available.

(*c*) The larger numbers in the regimental pool will enable the Expeditionary Force battalions to be kept up to strength with trained men without being drained to provide drafts for India and overseas, whilst the regimental headquarters can provide any special units required, and the armament of the Expeditionary Force battalions will not therefore affect the drafts ;

(*d*) Battalions being localised will enable the strengths of garrisons to be regulated regardless of battalion establishments. It will thus be possible to economise in men and, in the event of the regular battalion being replaced by a Territorial unit in war, the war establishment can be adjusted as required by regimental headquarters;

(*e*) There will be a closer touch between Regulars and Territorials owing to regimental headquarters and the home service battalion being permanently in their own district ;

(*f*) The larger list of officers will provide more field for selection without going outside of the regiment, whilst providing officers and other ranks with more varied experience of different forms of service ;

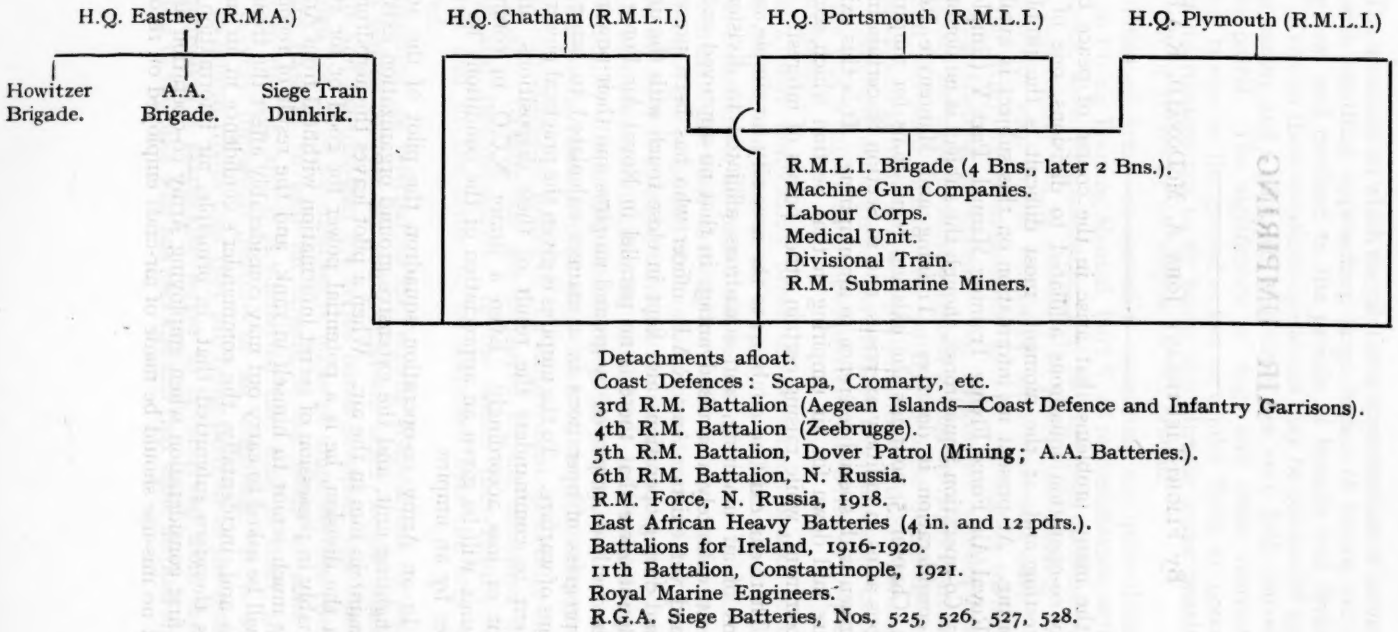
(*g*) There should be considerable economy in effecting reliefs, particularly if the smaller drafts are carried in H.M. Ships, besides leading to a closer touch between the Services ;

(*h*) With this system of drafts, officers and men from the Expeditionary Force battalions can impart their knowledge and training to the battalions abroad and thereby attain a higher general level of efficiency than can be looked for under present conditions.

The above proposals may be Utopian in their outlook, but, since modern conditions appear to require a more flexible organization, capable of producing both the old type of soldier for Indian and Colonial war and at the same time the scientific product for Continental War, it seems as though we may have to end by adopting some similar methods of organizing our forces to keep abreast of the times.

TABLE.

THE ROYAL MARINES IN THE GREAT WAR.



AIR UMPIRING

By FLIGHT-LIEUTENANT JOHN A. MCDONALD, R.A.F.

OF the many problems that arise in the course of peace training of Army co-operation squadrons affiliated to divisions, one of the most interesting and, at the moment, most difficult is the problem of air umpiring. At present no information on this subject is available from the Royal Air Force Flying Training Manual, Part V (Employment of Army Co-operation Squadrons), though the subject is no doubt receiving the consideration it deserves. Training and Manœuvre Regulations, 1923, Chapter 5, contains the existing regulations for umpiring in the various arms in military exercises, and in Section 86 certain instructions are given with special reference to air umpiring. It is this existing procedure laid down for air umpiring in that Section which seems to call for comment, while raising certain other points of interest.

There can exist no doubt as to the necessity for simple and efficient means of air umpiring, and squadrons affiliated to divisions are, at present, definitely at a disadvantage in that no approved and standard method yet exists. Any R.A.F. officer who has been present on the ground during operations and kept in close touch with the umpires will no doubt agree that there is no parallel in Royal Air Force procedure to the methods employed by ground umpires and their powers to direct the progress of operations in a manner calculated to bring home the lessons of warfare. To the umpires is given the practical power of making evident to commanders the result of their dispositions, and to give credit or loss accordingly. Even a junior N.C.O. in command of a sub-unit will be given an appreciation of the conditions he is fighting under by an umpire.

In an Army co-operation squadron the pilot of the aeroplane is the fighting unit, and the extensive ground organization exists in order to maintain him in the air. When a pilot leaves the aerodrome to work with the division, he is a potential power for good or for evil. He is probably in possession of secret information withheld from Army officers very much senior to himself in rank, and the result of reconnaissances he will be asked to carry out may considerably affect the trend of operations and, incidentally, the commander's confidence in air information. It is therefore submitted that, in principle, air information should be the first consideration when employing Army co-operation aircraft, and that no mis-use should be made of air-craft employed on reconnaissance

duties. The occasions on which the pilot gets opportunities of seeing and working with anything approaching large bodies of troops are comparatively few, and confined to the periods of brigade and divisional training. Even on these occasions operations may be conducted against a skeleton enemy and a pilot will sometimes see very little movement during his patrol. The significance of flags and other methods of representing troops on the ground is lost on a pilot flying at 3,000 feet with strict instructions not to fly below this altitude under penalty of being put out of action by an umpire on the ground.

The duties of Army co-operation squadrons are quite definitely laid down in Flying Training Manual, Part V, as reconnaissance, artillery reconnaissance, close reconnaissance, and photographic reconnaissance, and every opportunity will be necessary in peace time training to prepare the pilot for what in war will be his most important duty. Calls made by the Army on reconnaissance aircraft are certain to increase as peace time training progresses. The progressive development of radio-telephony for close reconnaissance is giving an Army commander and his staff increased facilities for putting definite questions to the pilot in the air, and keeping in good communication with him throughout his patrol. Similarly demands for the artillery reconnaissance machines made by the C.R.A. at division headquarters will be more evident as training progresses.

Should a pilot temporarily break off his reconnaissance to bomb troops and drop information to an umpire, he will have lost valuable time and in consequence his patrol will be less effective. If he is called on to discriminate between carrying on with his reconnaissance and attacking ground troops he will obviously be placed in a difficult position and, in war, will have to consider seriously the relative values of returning intact with whatever information he started out to obtain, compared with the possibility of inflicting casualties on the enemy, not to mention the risk of exposing himself to be shot down by fire from the ground.

A parallel example is found in the employment of cavalry during Army training. Cavalry are not employed for the combined duties of fighting and reconnaissance. In the former they require to be concentrated and in the latter to be dispersed over the area to be reconnoitred.

Air umpiring, as referred to in Training Regulations, is only in relation to actions between air and ground—in other words, combined anti-aircraft and machine-gun fire *versus* bomb dropping and machine-gun fire from the air. No mention is made of umpiring the effect of artillery fire brought to bear on targets as the result of zone calls received from the air, and it is submitted that this, in itself, should constitute a very important feature of air umpiring. It is surely important to inform troops that they are being fired on as the result of making themselves a favourable target to be observed from the air. It is only fair to the pilot who has sent the call that some method should

be evolved of informing the troops concerned that he is inviting artillery fire to bear on them, and is prepared to observe for fire effect.

Consideration might now be given to the possibility of air umpiring under the following three headings :—

(*a*) Umpiring from a fixed balloon as laid down in sub-para. 4, of Section 86 ;

(*b*) Allowing pilots the freedom of independent action in notifying umpires, by means of dropped messages, the action they have taken against troops, and by dropping harmless imitation bombs on the troops concerned ;

(*c*) Creating an independent " air umpire," who will be in the air during the exercise, with powers to decide the effect of air *versus* ground operations.

Regarding (*a*), there appear to be several serious disadvantages against this method of umpiring from a balloon. The balloon and its cable are a danger to flying, especially in conditions of poor visibility, and also because the balloon will, presumably, be flown in the middle of the area of operations. The radius of effective umpiring is very small, being given as two miles, and, in addition, this method does not cater for umpiring of artillery fire in response to calls from the air.

With regard to method (*b*), the danger of misusing reconnaissance aircraft for assisting umpires has already been pointed out. There exists nothing in Flying Training Manuals which would support such employment of aircraft. It cannot be really effective in practice since it does not convey to the troops concerned the exact extent of the action being taken against them, but simply informs them that they are being bombed or shelled. It will also lead, in practice, to complaints about aircraft flying low, and the probably justified claim that they were shot down by machine-gun fire.

With regard to method (*c*), it states in paragraph 4, Section 86, Training Regulations, Chapter V, that reports made out from air umpires on the ground and received at the report centre will be most effective if they are distributed by an umpire's aeroplanes.

The object of such a procedure is presumably to inform ground troops and their umpire at the earliest possible moment that they have been attacked from the air, and to convey to them the air umpire's decision. It will, therefore, be advantageous to consider any method which has the minimum delay in delivering this information, and which will, in addition, give the required decision to the ground umpire while the troops concerned are still in their exposed position, and thus help him to make his deductions. This method would appear to satisfy one of the elementary principles of umpiring by allowing the umpire to describe the situation as it actually is to the unit commander concerned.

An air umpire in a special umpire's machine would be in the most favourable position to carry out these functions. He is in the best

position for informing a ground umpire that troops are exposed to attack from the air. He can be in easy communication with the report centre, and therefore the chief umpire, and messages could be sent to him by picking-up apparatus or by W/T.

Under the present system of umpiring artillery fire, information is very unlikely to reach the umpire at the unit being fired on in anything like reasonable time for the full benefit to be obtained. With an air umpire in the air the decision of the artillery umpire could be conveyed to him *via* the report centre, and he would drop this information on the unit concerned. It would probably be of assistance if the chief umpire himself had his own receiving W/T set, and intercept all calls from the air.

It may be said against this method of umpiring outlined in (*c*) that ground troops do not get the training of retaliating against air attack by fire from the ground. This, in fact, only applies to reconnaissance aircraft and not to other types, such as single-seater fighters, specially detailed for gound strafing. There are many occasions when Army co-operation pilots can obtain practice in attacking ground troops.

To summarise generally, it would appear that air umpiring as outlined in Chapter V, Training Regulations, gives ground for considerable experiment, especially with a view to employing a pilot or observer for umpiring duties in the air. It is no doubt possible to umpire from a balloon on the system laid down, but such a method is dependent on land line communication or despatch rider, or both, and therefore is liable to breakdowns and delays. These may hold up the information until it is too late to be useful when it reaches the umpire.

The umpiring of artillery fire from the air is a difficult problem in itself, but if the principle of leaving reconnaissance aircraft unhindered to carry out their proper rôle is accepted, trials of various methods will be necessary during future training.

NOTE.—No mention has been made of aircraft put out of action by ground umpires. It is, no doubt, known that the anti-aircraft method of using a searchlight beam is generally accepted as satisfactory, both from the air and ground points of view.

"NONE SO BLIND AS THOSE THAT CANNOT SEE"

By Major R. H. Allen, M.C., R.A.

The ideal form of artillery support is that in which fire can be directed by observers so placed as to be able to follow closely the progress of the attack and at the same time with secure communication to their guns. The nature of the ground as well as dust, smoke, or mist will seldom allow of this form of support, and, since communication from observers to gun cannot be assured, artillery fire based on such factors can never be certain.—(F.S.R. Vol. ii, 72. 10.)

The Past.

(21st August, 1915.)

THE landing at Suvla Bay was dragging out to its unsuccessful conclusion. Many and varied were the reasons why the divisions of Kitchener's First Army had failed in what might have been a decisive stroke in the operations in Gallipoli. Lack of water, lack of thrust by the higher command, inexperience, all had a share in the inconclusive result. Now the last act of the drama was being staged. One final effort was to be made by the troops at Suvla to establish themselves on the high ground overlooking the Bay, and every gun of the Fleet and of the Army had been directed to cover the operation.

The Officer Commanding D/58 was sitting in his observation post on the morning of the 21st. Operations were not to commence until the afternoon. His post had been chosen in accordance with the instructions laid down in Artillery Training. He had good communication to his guns and an uninterrupted view of the ground over which the infantry would shortly advance. In brief he was in a position from which "he might be able to see where fire is required and to apply it accurately and promptly without waiting for orders. (A.T., Vol. iii.)"

The light was perfect, so clear was the air of Gallipoli that with good glasses details of figures could be distinguished at six or seven thousand yards when in England the figures themselves would hardly have been visible. But on this day of all days, as the morning wore on, a haze descended and gradually obscured the view. Impatiently the officer commanding D/58 wiped his glasses and softly cursed to himself. The clear air of Gallipoli was slowly thickening to a density to which he was well accustomed at home on the moors of Okehampton.

At last the time came for the attack to start, and soon there could be seen the brown dots of the infantry advancing from Chocolate Hill to Green Hill and thence on to Scimitar Hill. With many a pause the line advanced and finally passed over the rise of Scimitar Hill; all the while the fire of D/58 was directed in front of the infantry on the areas prescribed in the programme. Then a further complication arose to increase the haze and obscure the view. The shells of his own and other batteries had set fire to the scrub and slow spirals of smoke were climbing into the air and intensifying the mist.

For a time Scimitar Hill was hidden as by a shroud, then the haze lifted slightly and the officer commanding D/58 made out through his glasses a confused mass of brown dots scrambling up the hill from the far side. Who were they—friend or foe? Were they our own troops forced back and re-ascending the slopes they had so lately descended in the full tide of success, or were they the enemy pushing in a determined counter attack?

For a short time the Battery Commander peered and hesitated, gradually the brown dots drew nearer and nearer to the crest of the hill. Then he made up his mind, the brown dots grew more and more numerous, surely they far exceeded the numbers he had seen advancing tc the attack. He turned to his signallers: "Six rounds gun fire." A moment's pause and then the guns spoke out. But too late. The brown dots enveloped in the bursting shells poured in triumph up and over the crest. The counter attack had succeeded.

"Artillery fire based on such factors can never be certain."

(March, 1917.)

The Officer Commanding D/58 had become Brigade Major of the artillery of a division that was enhancing the laurels gained in Gallipoli by further feats of arms in Palestine.

The second battle of Gaza was not going well.

The division was attacking the hill whither Samson was reputed to have carried the gates of the temple of the Philistines, and the leading brigade was nearly wiped out. The situation at divisional headquarters was obscure, so the General Staff of the division sent orders to the Brigade Major of artillery to proceed to the hill to endeavour to clear up the situation and if possible to locate on the map the position of our leading troops.

The Brigade Major rode to the infantry brigade headquarters. There he found that three of the battalions had suffered heavy casualties but had reached a line which he was able to mark on his map. The position of the fourth was dubious, it had pushed a salient into the Turkish lines, supported by a battery of artillery, but how far it had got was not known. So he proceeded to the battery observation post. This commanded the ground over which the Battery Commander might

have seen what was holding up the advance, but the trouble was that, although he could see that the infantry had at least reached Outpost Hill, yet he could not possibly distinguish what was holding them up beyond; and all the time the air resounded with the clatter of machine guns.

The Brigade Major plucked up his failing spirits and crawled right up to Outpost Hill. There he found the unfortunate battalion packed in a narrow pocket some two hundred yards wide and some eight hundred yards deep. Well inside this salient he discovered the battery Forward Observing Officer, his wires cut, endeavouring to get the battery by visual. But one signaller had been killed and the other wounded, even to raise one's nose above the ground was the signal for a fresh outburst of machine gun fire, while from some unknown nullah to the left rear two hostile trench mortars were belching forth a stream of bombs that were bursting with a crash like the closing of Hell's gate. In vain did the observing officer attempt to open communication, and, even had he succeeded in doing so he would have been impotent to direct his fire against machine guns that were invisible or trench mortars buried in some deep ravine.

"Artillery fire based on such factors can never be certain."

THE PRESENT.

(June, 1926: somewhere in England.)

The Brigade Major, once more a battery commander, was, in accordance with Practice Camp orders, sitting at his observation post at K 1234, while his battery was in action in the adjacent hollow.

His was the second battery to shoot that day, and he whiled away the intervening minutes in examining the landscape. Though he had been seconded from his regiment for some years, Netheravon Bake stood as of old; Fox Cover was as unchanged and straggling as ever; while his range-taker verified his recollection that the range from his post to the gorse above Wexland Hanging was still 2,700 yards.

The first battery finished shooting and the officer commanding the practice rode up to the post:

"Now, of course, you have been away for a long time on the Staff, so you are probably rusty and not up to date. Never mind, I want you to imagine I am commanding a battalion that you are supporting. Well, do you see the gorse above Wexland Hanging? Carry your eye along the north edge: right at the end are two machine guns. I want you to engage them."

Old recollections flashed through the Battery Commander's mind; those of war on land and those of war on paper. The latter evoked a recollection of the past: "this officer is apt to differ from the recognised principles of training."

Still, as at Outpost Hill, he plucked up courage.

"But how do you know they are there, Sir?"

"How do I know! Havn't you got eyes? Can't you see the two big screens and the kerosene oil tins flashing in the sun."

The old words flashed again through his mind:

"Artillery fire based on such factors can never be certain."

THE FUTURE.
(A.D. 1935.)

The Royal Regiment of Artillery has been reorganized.[1]

The Battery Commander, still a Battery Commander, was attending for his orders at divisional headquarters. Outside stood an aeroplane, its propeller noiselessly ticking over: it was one of the new Silent Ghosts.

The Officer Commanding Royal Artillery spoke:—"I am authorized to send up a senior officer to control the artillery of the division from the air. As you have been twenty years a Battery Commander, I consider you fulfil the requirement as to seniority. Further you will have the advantage of your own son as pilot, and judging by the way you still hit across 'em at cricket, your eyesight seems to be as good as ever. Meteor will be through in a minute, turn on the loudspeaker one of you."

A familiar voice rang out: the announcer had been impressed for the duration of the war.

"G.H.Q. calling the British Army. Here is the weather forecast! A deep depression centred off Iceland is rapidly moving S.E.——"

"Confound it," said the O.C.R.A. "and zero in an hour . . . Still, off you go!"

The Battery Commander saluted and went out. Rather stiffly he climbed into the machine, nodded to his son, and off they flew to control the fire of the 1st Division in the first battle of the new Great War.

Soon the aeroplane had gained its height and silently moved to and fro as they waited for zero.

Zero. The old familiar line of dots started from the assembly line and moved slowly over the ground. Then the line checked, a group of white puffs some distance to the left front, the Battery Commander spoke down his 'phone. Four batteries concentrated on the spot, a few rapid bursts of fire and the dots moved on. But what was this? A thick swirl of cloud interposed its white bulk, down went the nose of the machine and once more their view was clear.

But thicker and thicker massed the clouds till from this height there was no hope of seeing the battlefield.

The son spoke: "It's no good, Father, we must go right down."

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[1] *Duncan Essay* Gold Medallist for 1926-27 suggested a reorganization of the Artillery in which, among other innovations, the control of Divisional Artilleries was to be carried out by a senior artillery officer from the air.

Straight down lower and lower sped the aeroplane till at last it burst through the clouds and flattened a few hundred feet above the ground. Then all Hell broke loose. Automatic fire had quadrupled in the last few years and the machine was greeted with a clangour the like of which the Battery Commander had never heard during the war of 1914–18.

Almost instantaneously the wings of the machine were riddled through and through, the pilot gave a gasp and shrieked "They've got me, Father!"

But no answer came from behind, for the old Battery Commander had drooped over the side, a trickle of blood dripped from his forehead, his glasses had fallen from his nerveless fingers. Swaying from side to side the plane hurtled down to crash upon the ground below.

"Artillery fire based on such factors can never be certain."

THE SOLUTION.

At last it had been recognized that the location of machine guns from distant observation posts was an impossibility. It had been recognized in principle that increased mobility was dependent upon better control, and that better control meant improved communications. Also these improved communications ensured that the numerous eyes of the guns—possessed by infantry as well as by artillery—produced a quick response to the need of fire. Divisional artilleries were now dependent upon a multiplicity of eyes pushed as far forward as conditions permitted.

At length effect had been given to the dictum of that great gunner, the late Major-General C. E. D. Budworth :—"I consider shrapnel shell to-day to be in the same position as case shot when I joined the Army."

As a result the 18-pdr. of those days had been relegated to the museum or the public square, while our field artillery had been re-armed with a field howitzer of far greater range and shell power than the old 4.5 inch weapon of 1914–18. The concomitant increase of weight had not embarrassed design, since it was no longer hampered by considerations of 40 cwt. behind the team. The full power of fifty horses in a petrol engine was at its disposal. No longer did Battery Commanders endeavour to pick out machine guns with the naked eye; every battery sent forward a least three observing groups—not Forward Observation Officers—for it had been found that, if an Indian N.C.O. can control artillery fire, his British prototype can do so equally well.[1]

[1] In 1923 the M.G.R.A. India was with a picket in Waziristan. A Ghurka naik was in command of the picket. The M.G.R.A. asked him:

"If you saw that nala in front full of Mahsuds what would you do?"

"Call up the Tope khana by clock code," came the reply.

"All right," said the M.G.R.A. "You can have twenty-five rounds, carry on."

The Ghurka called up the guns and successfully directed them on to the nala in question.

These observing groups were equipped with beam wireless as well as their alternative Lucas lamps. As the infantry were similarly equipped the information as to hostile areas of resistance flowed in from numerous duplicated sources. The prefix "Co" had been added to "Operation" in fact as well as in the Manuals.

Such areas could soon be located and pounded with high explosive or blinded by smoke.

The new Manual reads :—"Efficient artillery support is dependent upon accurate information from infantry as well as from artillery sources. This information, in turn, can only be disseminated by means of good communications. The certainty of artillery fire is dependent on these factors."

THE OBSTACLES IN THE WAY OF MECHANIZATION OF THE ARMY

By Brevet-Major B. C. Dening, M.C., R.E., p.s.c.

WHEN the Great War came to an end in 1918 the view naturally prevailed that the lessons of the war would lead to many changes in the Army, particularly in the realm of mechanical transport. Nevertheless, to-day, after a lapse of nearly nine years, it is questionable whether the Army differs greatly from that of 1914; it has certainly gone back much upon its composition in 1918. Compared to 1914 we now have a few armoured car companies and tank battalions and the transport of the administrative services is largely machine driven. Yet compared to 1918 there has been a great reduction in the total number of tanks and mechanical vehicles maintained—if not in their proportion to other arms.

It was inevitable that for a considerable period after the Armistice, no extensive steps could be taken towards reorganizing the Army upon ideas evolved during the war. To begin with, the events of the war required to be contemplated from a certain distance to enable their true lessons to stand out. Time was necessary to allow matured conclusions to be formed. Secondly, a number of the inventions used in the war were really in their infancy in 1918. Time was again needed to enable experiments to be made and decisions to be formulated as to what were suitable weapons and vehicles for permanent incorporation in the Regular Army. Before much progress could be made, in order to meet a general demand for economy in all the Services, military expenditure was cut down to a degree which hampered any ideas of extensive development.

Undoubtedly one of the chief stumbling blocks to the adoption of a definite programme of development in any army has been that it is very difficult to obtain general agreement as to what conditions of war will be like in any future great struggle. Some contend that well-defined circumstances made war on the Western Front a special case, more akin to a siege, and that, given the reverse circumstances, wars of motion, such as were seen in Rumania, Palestine and Iraq, are still possible with armies of the type of 1918. Others hold the view that the power of modern firearms is so great that a war with such armies is bound to end in early deadlock and that the only chance of creating a war of motion is by the use of large armour-protected mechanized

forces. Few soldiers to-day see eye-to-eye as to the course which a war between large civilized Powers may follow. The correct view lies probably in between the two extremes. A reasonable forecast of the course that war would take to-day—so it appears to the writer—is that in most theatres, with the present armament of armies, a state of "stalemate" similar to that experienced on the Western Front in 1914-1918 will frequently occur, but that, given suitable terrain and ample new mechanical weapons, a decisive war of movement is possible.

In days of financial stringency, it is obvious that a nation can only afford to prepare for the most probable, average, type of war. On this basis, it seems likely that our military forces will be faced partly with terrain suitable to the use of cross-country fighting machines, and partly with ground which is unsuitable. It would appear that the average circumstances of such warfare will combine the conditions associated with open, rapidly moving, fighting, with those inseparable from slow siege operations. If such is the case, the correct course would seem to be *to provide the strong mechanized forces required in the traversable country and the other type of army required to conduct siege forms of war.*

There are several other causes which have militated against any great change in the organization of the British Army. The first is that attention has naturally been more concentrated upon the immediate peace rôle of the Army rather than its rôle in a large continental war. The second is that opinions are very divided as to how far it is safe or expedient to displace men and animals by machines in our Army in particular. The third is that finality has not hitherto been reached in the development of the various mechanically-driven machines which will be the basis of any change. The fourth is the difficulty, ever present, of finding money to cover the cost of any transformation. It is for consideration how far we are justified in allowing these difficulties to deter us from making changes and whether we have not reached the stage in which we should make a bold forward movement.

As regards the first difficulty, that of harmonizing the peace rôle of the British Army with its war rôle, it is possible that we place too great importance upon the task that is ever with us at the expense of preparation for a more momentous duty in the future, just because the latter is at the moment, still undefined.

In time of peace, the *raison d'être* of the British Army is to find a large number of small overseas garrisons and the reliefs for them. In each garrison the primary requirement is a unit armed with weapons suitable for maintaining local order. The units, up to date, have been mainly infantry, armed with rifles and a proportion of automatics. For modern war, however, it has been pointed out that there should be partly strong mechanized forces and partly siege warfare forces. The former would naturally include such arms as heavy and light tanks, armoured cars and aircraft while the latter would consist of the arms of 1918, exclusive perhaps of cavalry. The normal provision for peace,

then, does not tally with the requirements for war, except possibly as far as the forces for siege warfare are concerned.

It has, hitherto, been held that any alteration in the composition of the units of the British Army will make it impossible to work the Cardwell system of reliefs and the normal rotation of units from station to station, particularly from home to abroad and vice versa. This contention is probably absolutely true. Any conversion of a portion of the infantry, for instance, into special mechanized tank units would make it impossible for such units to be sent to every station that an infantry unit has occupied in the past, if only because of the accommodation question. This must throw out of gear our whole relief system. This difficulty brings us right up against the question of whether it is necessary to continue with the Cardwell system, at least in its entirety. Not even the United States, where a voluntary system of recruitment prevails, has found it necessary to adopt an analogous system. It certainly seems that the time has come to re-examine the Cardwell scheme, even though it has proved itself excellent over a long period. If a modernization of a large part of the Army is to be undertaken, that moment has come.

But such a change cannot be lightly undertaken, since it cannot but cause a convulsion and a re-orientation from head to foot in the Army—and, temporarily, much disorganization. All this the naturally conservative soldier will attempt to defer. But is it wise to postpone the changes and temporary disorganization until trouble is upon us? It is surely a maxim that during actual war existing organization should be tampered with as little as possible. If that is so, the period of disorganization should be safely got over in peace.

It would seem that an amended form of the Cardwell system could be evolved and introduced gradually. Supposing the Army, both at home and abroad, were definitely divided into two types, old and new, to meet the two requirements in war. Thus of the 126 battalions, nominally half at home and half abroad, let us suppose that sixty are required as "old type" units with their present organization (thirty abroad and thirty at home), and that sixty-six can be converted to mechanized forces (half to be abroad and half to be at home) it would still be possible, to a large extent, to retain the advantages accruing from the Cardwell system and at the same time to go ahead with mechanization.

Passing to the second difficulty, namely, doubt as to the safety or expediency of displacing men and animals by machines, the chief argument raised against any programme of conversion is that we do not know in what theatre the British Army is likely to be employed. That is perfectly true as regards the national Army raised in war but not so true as regards British peace time regular forces. For the latter the scene of operations is largely known. Their main function is the defence of our overseas possessions and the nature of the ground likely to be the scene of any fighting in defence of these possessions is more or less

defined. We know the terrain likely to be fought over in the defence of Egypt, Palestine, Iraq, or of various parts of India. Actually the sixty-three battalions abroad prior to the Chinese commitments, were required as follows :—

India and Burma	45
Egypt	7
Sudan	2
Gibraltar	2
Malta	2
Iraq	1
Aden	1
Hong Kong	1
Singapore	1
Jamaica	1
	63

Of those in India, only a proportion can be utilized on the N.W. Frontier. The remainder and all the other battalions abroad are required for the maintenance of internal order or for defensive duties against possible local external attack. For the units except those required on the N.W. Frontier and possibly in the Sudan it is surely the case that both from the point of view of terrain and the duties to be performed, mechanized units of armoured vehicles are better military instruments than units of infantry, unprotected and obliged to march, in most cases in extreme heat. For the peace rôle of the majority of the British Army the contention that it is hardly safe or expedient to pass to mechanization does not really hold.

The third difficulty facing the advocates of a far-reaching mechanization, is that finality has not been attained in the production of the most efficient machines. But here the question naturally arises as to whether there will ever be finality in the production of any machine. Has finality been reached in the design of the best field gun and the best aeroplane? Certainly not, for progress is continuous. Has that deterred the Powers from using the field gun for the past fifty years and from constructing thousands of aeroplanes? This question of finality in the design of weapons is, in fact, a perennial problem; it should be dealt with to-day as in the past. A new invention should be given an experimental period, after which progressively increasing production should be undertaken, each year's products being varied slightly from the last to include the previous year's improvements in design—if any. In the cases of the light tank, the armoured car and the most suitable vehicle for first line transport we are reaching a stage where the initial instalment of general production might be safely undertaken without fear that present types will be so hopelessly out of date at the end of their normal life as to be useless or even a hindrance

to the Army. Should a war come, after all, an Army with many tanks of not quite the latest pattern will be far superior to an Army possessing only a few tanks of the latest design.

Lastly, there is the difficulty of finance. There can at the present time, be no question of an increase in the Army Estimates. Changes, increases of weapons or vehicles, call for large expenditure. There is only one way in which the necessary funds can be found and that is by a reduction in the numbers of men and horses maintained in peace. At first sight, and so soon after the Geddes reductions, any mention of further reductions of Army personnel would be quite unacceptable to a soldier. There is, however, this difference: whereas the Geddes reductions represented a net dead loss in power to the Army, a reduction now would presumably be offset by an increase in power acquired by the possession of numbers of powerful and mobile units. Actually, the man and horse as maintained in peace are expensive items. The approximate annual costs are respectively £120 and £40. Thus for comparatively small reductions in men and horses large annual sums can be saved. Space prevents the discussion in detail here of how money can be found to carry out the mechanization of the Army. That it can be found there is no shadow of doubt, provided that we are prepared to accept two essential changes (*a*) the replacement of a certain proportion of our infantry battalions by a lesser number of powerful mechanized units, and (*b*) the substitution in all regular units at home for all horse transport of mechanical transport, organized upon a supplementary reserve basis.

To sum up the position, then, it is to be observed that—

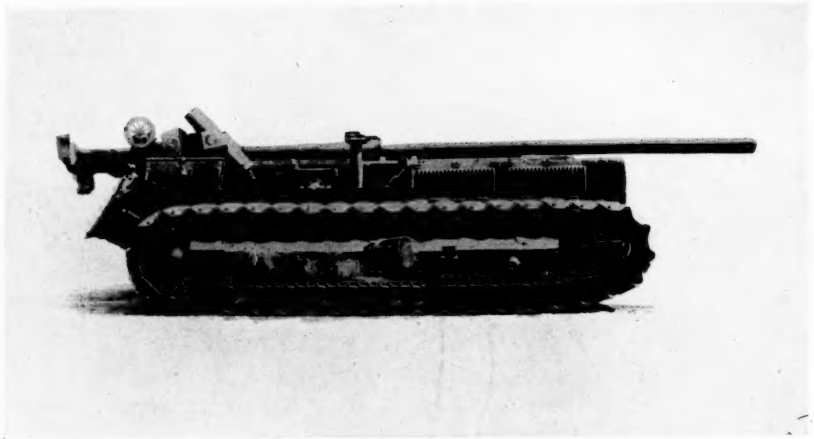
(i) A probable course for a war under modern conditions can be approximately forecasted;

(ii) The requirements for such a war are covered partly by strong mobile mechanized forces and partly by siege forces;

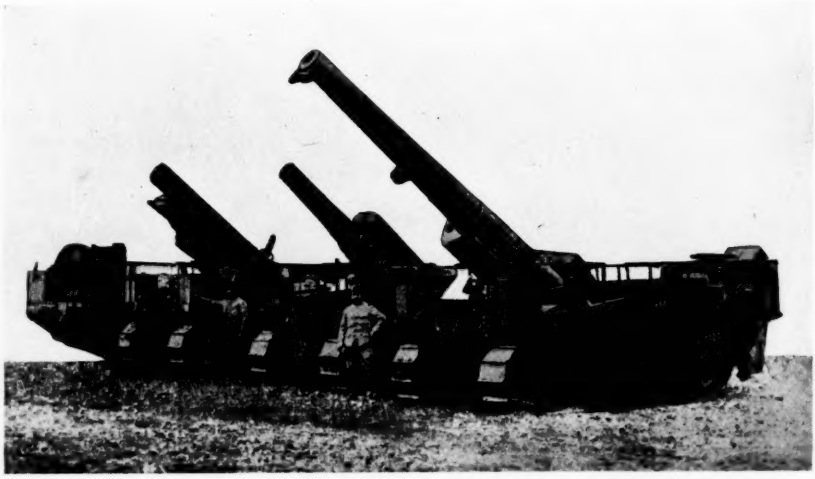
(iii) A large part of the British Army requires conversion to provide the mechanized forces;

(iv) Progress in mechanization is held up by certain main difficulties, i.e., the Cardwell system, the question of safety under conversion, the problem of finality in design and finance.

None of the obstacles to mechanization are insuperable. Change will eventually be forced upon us when war comes and it were better accepted in good time and the confusion of a change during war avoided. But the developments involved in solving the problem are so extensive in their application, that, though they are inevitable, they will take many years to come into actual being unless considerable thought is expended upon them and the ground is suitably prepared. Not only at home, but more particularly in India, there must grow up a strong conviction upon this subject before progress can take place. Such conviction can only come through study and continuous discussion.

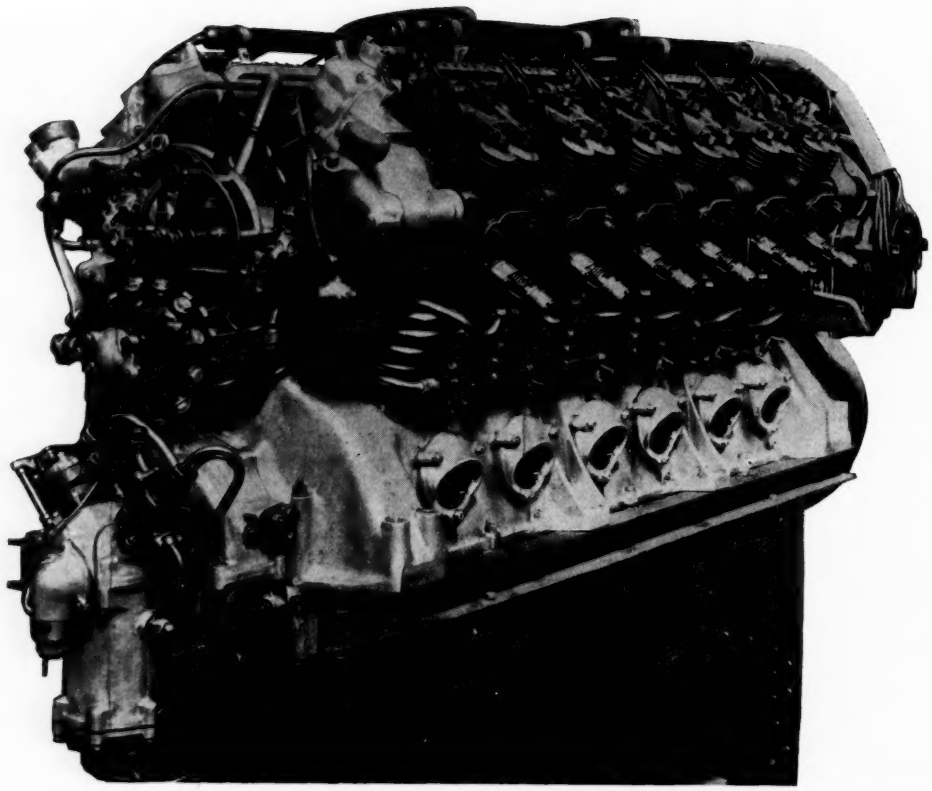


UNITED STATES
155 mm. GUN ON MOTOR CARRIAGE.



FRANCE
EXAMPLES OF NEW ARTILLERY.

FOREIGN MECHANIZED HEAVY ARTILLERY.



A TYPE OF MODERN WAR MOTOR

ONE OF THE FIVE 420 H.P. 12-CYLINDER MAYBACH ENGINES OF THE U.S. NAVAL AIRSHIP "LOS ANGELES" (Z.R. III)

(See Airship Notes).

NOTE.—Actually, the "Los Angeles" cannot, by the conditions of surrender from Germany, be used for war purposes.

THE INTERNAL COMBUSTION ENGINE AND ITS INFLUENCE ON WAR MATERIAL

By Engineer Captain G. W. Phillips, R.N.

On Wednesday, 9th March, 1927, at 3 p.m.

Air Vice-Marshal Sir Vyell Vyvyan, K.C.B., D.S.O., in the Chair.

The Chairman introduced the Lecturer.

LECTURE.

THE present state of development of internal combustion engines is such that the suitability of modern engines of this type for the generation of power for almost any service is a matter deserving careful consideration when deciding on the type of prime mover. For some purposes, indeed, there is at present no effective competitor.

The development of aviation and the remarkable extension of the use of road transport are due almost entirely to the advantages possessed by these engines.

For the comparatively low-powered engine units required for road vehicles, petrol engines are in general use on account of their reliability, easy starting, low weight and first cost and convenience of fuel replenishment, but it does not follow that their predominance will be maintained in future and the possibilities of compression ignition engines which can use the, at present, much cheaper fuel oils with high flash point must be kept in view.

Petrol engines have up to the present been used for all heavier-than-air machines and for dirigibles. Owing to the inflammability of petrol and its high cost and to the greater possible thermal efficiency of the compression ignition engine, development of these engines in units of moderate power is taking place and should these developments make it possible to reduce the weight of the type of engine to acceptable limits while maintaining the desired reliability and durability, they may replace the petrol engine in future.

For ocean-going vessels where internal combustion engines have been used for propulsion, the heavy oil engine is the usual type. In the naval Service the internal combustion engine has already played an

important part in development of material. It has been used almost exclusively for the surface propulsion of submarines; in the earliest days in the form of petrol engines which, in view of the evident risks in the confined spaces of a vessel, were replaced by heavy oil engines as soon as a reasonable standard of reliability was established with such designs. Heavy oil engines of both four- and two-cycle types have been employed, but the four-cycle designs have predominated and have latterly been generally used in association with air injection. The improvements in air compressors, in early days a troublesome feature, have facilitated the use of air injection and so have contributed to good combustion and a reasonably clean exhaust, which is an important quality in warlike operations.

An exception to the use of the internal combustion engine is to be found in the " K " Class of fleet submarine in which the power needed to attain the high ship speed required was, at the time, beyond what that engine could give. This entailed the use of steam.

The internal combustion engine possesses, however, such very important advantages over steam for submarine work, including better fuel economy, easier and more certain operation of ship orifices when preparing to dive and better habitability conditions, that the use of steam does not appear likely to be extended unless future requirements as regards ship speed again outrun the existing possibilities of the heavy oil engine.

Diesel engine electric generators have been employed in the larger ships as part of the total electric generating equipment for the past twenty years and have given good results together with a sensible reduction in the harbour fuel consumption. This, as is generally known, forms no inconsiderable proportion of total fuel expenditure. The increased fuel endurance which they promote also contributes to the fighting qualities of the ship. It is hardly possible to press this source of attaining further fuel economy to a logical limit and fit a complete equipment of oil-engined electric generators, because the extra weight and space required would entail the abandonment of other valuable features, observing, too, that the fuel stowage is left out of consideration in assessing the limiting ship displacement.

The restrictions on machinery weight which operate with increasing force in the modern cruisers designed on a limited displacement have not permitted the use of the internal combustion engine for electric generating purposes.

This type of engine in its explosion form has found increasing use in power-propelled boats and considerations of weight reduction have led to the entire abandonment of steam-propelled boats in current naval construction. This change is perhaps not viewed with great enthusiasm afloat as the reputation of the motor boat for reliability and durability suffers somewhat in comparison with the steam-propelled boats. This lesser reliability must be admitted and a higher standard of upkeep

is entailed. The disability arises in part from the storage restrictions on board a warship, which entail the use of paraffin. Apart from its lesser volatility, commercial paraffin varies a good deal in its qualities and difficulty is met in getting uniform quality supplies. In any case the variety of types of engine and the somewhat limited demand, viewed commercially, have not permitted the same concentration on the design of the paraffin engine as in the petrol engine used for road transport; its development is accordingly backward. Mechanical difficulties also arise in reversing and service in the smaller boats exposed to sea and weather leads to troubles with the ignition. Nevertheless the paraffin engines have given a fairly good account of themselves and have added considerably to the amenities in smaller warships.

In still larger sizes, petrol engines have served a strictly military purpose in coastal motor boats during the war and to some extent in the motor launches (M.L.s). In the coastal motor boats particularly light engines, viewed by naval standards, were produced, and this necessary cutting of weights was reflected in their durability. The opposition of the contractors to a two hours' full power trial on the grounds that the life of the engine would be unduly shortened may therefore be appreciated, although it led to some caustic criticism of the design.

Particular interest in the internal combustion engine for naval use turns on its possibilities for the propulsion of surface warships and in view of the prominence which is given to this matter and the criticism made from time to time, it is desirable to ventilate the technical considerations involved.

It is incontestable that the heavy oil engine is greatly superior in economy to steam plants in their present form, roughly in the ratio of 2 to 1, and this advantage constitutes almost the sole claim to its consideration for naval use.

As is generally known, the use of the heavy oil engine has grown in a remarkable way in the mercantile marine and this increasing use proves in a most convincing way that the economy of fuel and a proper standard of reliability and durability is being maintained on service. It is to be observed that the great majority of the installations now running are fitted in the relatively low-powered cargo type of ships and the conclusion to be reached from the extended use in such types is that the heavy oil engine designs will pay a higher dividend than steam when all the factors, including first cost, fuel and running costs, etc., are taken into account. In short, the charges on the higher capital costs are more than balanced by the lesser fuel costs. The difference is on average a somewhat narrow one, but under the present highly competitive conditions in the shipping world which are likely to continue, narrow margins prevail and the correct choice of engine type may very well settle whether a net profit will accrue. The contemporary advances in steam practice which are being developed in shore plants and which

have in isolated cases attained fuel economy closely approaching that of the heavy oil engine cycle, may conceivably reverse the situation afloat in a few years hence, as the advanced steam practice referred to moves into the marine field of application.

As has been indicated, the outstanding advantage of the oil engine rests in the economy in fuel. The full extent of the advantage in this respect which has been demonstrated in the Mercantile Marine would not necessarily be realised in the naval Service, since naval vessels do the greater part of their sea time at very low speeds.

On the other hand, however, its availability for proceeding at short notice is of value to the Navy, and this quality would somewhat further enhance the superiority in fuel economy, as the "standby" losses, unavoidable in a steam plant held in readiness for high power at short notice, would be reduced.

Warship Requirements.

The requirements for the machinery of high speed warships, however, entail very large engine powers and low engine weights, and it is in these two features that the heavy oil engine fails, in its present form, to indicate a reasonable promise of meeting the possible requirements in a practicably dependable way.

In modern naval steam installations the "all in" weights of machinery per S.H.P. range from 33 lbs. for destroyers to 119 lbs. for battleships. For cruisers the figure is 49 lbs. With allowances for the improved fuel economy of the heavy oil engine and providing for a proper proportion of the saving in weight on account of the smaller quantity of fuel to be carried to be credited to the heavy oil engine weight, we get the maximum weights which can be allowed for internal combustion engines to be about 40 lbs. per S.H.P. for a destroyer installation, 71 lbs. for a cruiser and 170 lbs. for a battleship.

From the leading particulars of typical merchant service designs, including those of the highest power yet built, we get the lowest actual corresponding weight to be 360 lbs. We see, therefore, that the weight of the internal combustion engine as at present fitted in the Mercantile Marine is much too great for use even in battleships, while for cruisers or destroyers it is quite out of court.

The wide gulf between the commercial and the naval requirements will afford an indication of the necessity for independent research and a separate line of development for naval needs. This work has been in hand at the Admiralty Engineering Laboratory for some years. The requirements for the Submarine Service have been those immediately in view, and here appreciable advances have been made in meeting demands for larger and more dependable units.

In order to understand the further possibilities of the internal combustion engine for naval purposes, it is desirable to refer to certain

of the technical aspects involved in developing higher unit powers and lighter engines.

Restricted weight and headroom necessitate the naval engine being a high-speed engine of comparatively short stroke, i.e., running at a high piston speed and at a high speed of revolution. Further, in order to attain a maximum power output, it must operate with a high mean pressure in the cylinder but without unduly high maximum pressure. This governs to a considerable extent the scantlings of the important parts and so influences the weight.

The use of high mean pressures tends to set a limit to the diameter of the cylinder and so to the power developed. This follows directly from the high temperature of combustion and from the fact that as the diameter is increased the extent of the heat receiving surface becomes less in proportion to the heat transmitted from the burning gas. Thus it follows that the attainment of high mean pressures in cylinders of large diameter imposes a higher heat stress than in small cylinders. This is further aggravated by the necessity of giving heavier scantlings to secure the strength required to withstand the higher maximum pressure. This influence can be countered to some extent by special measures in respect to shielding and cooling, and the large designs are probably better suited to such devices, but those designs, employing high mean pressures, are in the nature of things, less reliable than those that are more moderately rated.

The question of obtaining efficient combustion when using high mean pressures in high-speed, i.e., short-stroke, engines is also of considerable significance, and the difficulties of ensuring satisfactory combustion increase as the rate of combustion is raised. These complicated relations between weight, space, and power output combine to set a limit to the power obtaining from a single cylinder according to the type of engine, if reasonably good reliability is to be realised without undesirable complication. The attainment of the high aggregate powers indicated will therefore lead to undue multiplicity of cylinders in any case, this disability, however, being lessened as the engine type is advanced. This consideration, coupled with the marked handicap in weight from which the large power single acting Diesel engine can hardly fail to suffer in comparison with the steam installations, leads to the conclusion that for the surface warship the double-acting type gives the greatest promise.

The well-known mechanical difficulties, and in particular the attainment of adequate longitudinal rigidity of the engine on a reasonable allocation of weight for engine structure, render it imprudent to attempt to couple more than eight or at the most ten large cylinders on a single crankshaft.

On this basis it would appear with our present knowledge that the limit of power within sight in a single fast running engine of proportions suitable for warship work is about 10,000 S.H.P. Such an engine could

probably be designed to fall within the limiting weight given, although the indications are that some 20 per cent. additional ship space beyond that required for a steam plant would be necessary to accommodate the complete installation including the electric generating equipment for ship and fighting auxiliaries. On this account also the weight of the machinery necessary to provide the power for the large fighting auxiliaries imposes a heavy tax on the total machinery weight. It is to be observed that the higher centre of gravity of the machinery would entail an increase of beam or a decrease of metacentric height.

It is to be noted particularly that the weight of the propelling machinery would be less than one-half that of the higher powered mercantile internal combustion engines and accordingly, notwithstanding all precautions in design and the use of the highest grade material, a lower standard of reliability and durability would be inevitable. It must be remarked, too, that the higher powered mercantile installations have not been long enough in use to form any accurate idea of their qualities in these respects.

It is to be noted that the horse-power output of the engine is below the requirements of current naval ship designs, which range per shaft from 13,500 in a destroyer to 36,000 in a battle cruiser. Alternatives exist, however, by means of which a high-speed engine may be used for a high-powered installation ; such, for example, as one of a number of power generators in an electrical transmission design, or again, as one of a number of power units geared to the propeller shaft through some form of flexible transmission. The weight of the additional fittings would certainly prohibit these alternatives in naval service on a Diesel drive.

The principle has, however, been employed in the cruising installation for the minelayer " Adventure " which is driven by 2-3,000 B.H.P. Diesel Engines with electrical transmission.

It remains to be mentioned that the problem of the application of the internal combustion engine to surface warships would not be solved entirely with the production of a reliable and durable unit developing the required high power and falling within the desired weight and space. Other difficulties remain, and of these particular reference may be made to the necessity for flexibility, which is of such great importance in the Navy. The naval engine must be capable of running steadily at the very low powers and reduced speeds corresponding to cruising conditions. It must be responsive to rapid changes of speed and must settle down steadily and quickly to any desired intermediate speed. These requirements bring with them special problems from the combustion and control aspects which are matters for special investigation and development as an essential part of the main problem.

The question of ship vibration is also a matter which requires serious attention. The development of naval weapons has been attended by

a continuous growth of appliances on which they depend for their efficient use. Range-finders may be quoted as an example. Particular attention has accordingly been given in recent years to the elimination of all possible sources of vibration in naval designs and the use of an engine of the crank type would from this point of view be a retrograde step. Apart from the direct effect of engine vibration on the ship, experience in submarine engines, admittedly unfavourably situated by design restrictions, has indicated that the effect of torsional vibrations cannot be entirely avoided in a practicable design throughout the full range of engine speed. This consideration necessarily limits the choice of ship speed on service. It is probable that, in the larger ships, the effect of the torsional vibration would not prejudice the installation to the same extent as in submarines, but the source of the vibration would still exist in any crank engine and would lead in varying degrees, to disabilities in comparison with a rotary drive. In this connection the development of the Michell Crankless Engine for use on an internal combustion engine cycle is viewed with much interest, and it seems more than possible that this design will find increasing use in future. At the present time its development has not proceeded very far.

The Internal Combustion Turbine.

These unfavourable comparisons between rotary and crank shaft drive naturally suggest some reference to the internal combustion turbine This problem has so far baffled the ingenuity and resource of the workers in this field ; indeed the prospects of such a machine are so poor as to induce experimenters having reasonably clear ideas of the underlying principles involved to give it a wide berth, at least so far as large scale experiments are concerned. It would appear that the enthusiasm shown in some quarters for the internal combustion turbine rests on no more solid foundation than a comparison between the steam turbine and the steam reciprocating engine, and it is argued that, if the steam turbine is superior to the steam reciprocating engine then the internal combustion turbine must be superior to the internal combustion reciprocating engine. This is really an application of the rule of three applied to unlike quantities. In point of fact, the advantage referred to only applies to the use of a fluid possessing properties analogous to steam and there is no parallel between the two problems. On the contrary, the internal combustion turbine is at great disadvantage and this arises from the fact that the efficiency of the cycle is dependent on the degree of initial compression, increasing with it. Briefly speaking, the internal combustion engine has a great advantage in attaining the compression within the power cylinder in the most economical and direct way, and no compressor outside the engine is required to fulfil the cycle, as would be necessary with the internal combustion turbine. This question of an air compressor is really the gist of the problem involved in developing a satisfactory internal combustion turbine, and no design so far produced shows promise of approaching in a reasonably practicable

way the efficiency of the crank engine. A mechanical difficulty arises in connection with the materials of the turbine, in particular the blades, having in view the high temperatures and the impracticability of cooling. This difficulty is probably not insuperable.

Military Motor Vehicles.

The development of the petrol engine, with the consequent improvements in reliability, economy of operation and reduction of first cost, has led to the extensive replacement of horse traction by motor traction. For commercial purposes the horse is now comparatively little used for transport work and for deliveries within moderate distances motor vehicles are serious competitors of the railways.

The same change is taking place in military transport though at a slower rate ; but with the steady progress in the development of partial and complete track motor vehicles and the successful performances of the six-wheel lorries, the change-over is likely to progress rapidly in the near future.

From the Press descriptions and illustrations of trials of military motor vehicles which were recently held in Dorset, it can be inferred that these vehicles are becoming increasingly independent of prepared roads and thus more suitable for service requirements.

In this connection it has to be remembered that, to provide the necessary expansion of transport capacity in case of emergency, it is desirable that commercial vehicles should generally be suitable for military purposes, or better still shall be similar to service vehicles.

One of the most notable military instruments produced during the war was the tank. The development of this weapon was made possible by the existence of the internal combustion engine as a compact and reliable power producer. Various types of this engine have been used during tank development. The one generally fitted at the present time is an 8-cylinder V air-cooled engine, though, on account of its superior accessibility, a vertical engine may replace it. An air-cooled engine has several advantages as compared with a water-cooled engine for this service. The risks from mechanical damage to the water-cooling system are greater in a tank than in any other road vehicle and, even ignoring the risk of functional troubles, the advantages are generally with the air-cooled type.

For portable electric light plants and for field searchlight equipment, the internal combustion engine is without real competitor.

The relatively low flash point of the motor spirit used in existing engines is manifestly a considerable disadvantage in machines employed on military services which necessarily entail much greater fire risks and lead to casualties out of all proportion to those consequent on mechanical derangement. There is also the indirect effect on morale which can hardly fail to arise. These risks would be considerably reduced

if engines were available, capable of using fuel of much higher flash point. Accordingly steps are being taken to develop suitable compression ignition engines of this type for military purposes. Such engines, on account of simplicity, will generally be of the airless injection type. Considerable success has been achieved to date and an air-cooled compression ignition engine suitable for fitting in tanks, is a possibility of the not far distant future. One of the greatest difficulties is that of starting. The torque required is very much greater than for a petrol engine of equal power and where space and weight are extremely limited the provision of suitable starting apparatus is by no means easy.

Compression ignition engines suitable for commercial vehicles are also being developed, particularly in Germany, where the M.A.N., Mercedes, and Benz Companies, are making considerable efforts in this direction. A small number of water-cooled 45 B.H.P. 4-cylinder, 4-cycle airless injection engines have been produced by the M.A.N. Company, and one at least of these engines has been sent to this country probably for the purpose of selling licences to manufacture. These engines are at present rough in operation, but they will be improved.

The relatively low price of the fuel doubtless commends these engines, but should they show serious signs of displacing the petrol engine in commercial work the disparity in price of fuel would undoubtedly decrease accordingly.

Aircraft Engines.

By far the greatest achievement of the internal combustion engine has been its contribution to the solution of the problem of flight. No sustained flight was possible until this form of power generator gave the necessary $\frac{\text{Power}}{\text{Weight}}$ ratio.

It may be stated generally that the great advances made in the performance of heavier-than-air machines have been to a considerable extent due to the development of the aero engine. In no application of power is reliability more necessary than in aviation and when the other conditions which have also to be satisfied are considered the difficult nature of the problem to be solved by their designer can be readily appreciated. The engine must give a high value of $\frac{\text{Power}}{\text{Weight}}$ if the machine is to be capable of a good performance, in fact the lowest value of this ratio for an aero engine must be considerably higher than the highest for any other type of engine if flight is to be possible. The engine used by the Brothers Wright in their early flights developed 30 B.H.P. at 7 lbs. per B.H.P.

This engine was much lighter for the power developed than any internal combustion engine in use for general power purposes at that time and the great difference between aero engines and other types as

regards weight for power still exists. This has been achieved by the use of special materials, to some extent regardless of cost, by high speed of revolution, advantageous distribution of material made possible by extensive machining of the various parts, by the use of forgings instead of castings, and by the acceptance of a comparatively limited total effective life of the engine. Yet, notwithstanding the last condition the advances made in all-round qualities have been very considerable. In the endeavour to reduce weight, air-cooled engines naturally received early consideration and the first big step forward in the direction of weight reduction was made by the Gnome engine. The various models of this air-cooled rotary engine maintained the advantage as regards engine weight over their contemporaries and until the demands for still higher powered units outran the effective range of the rotary type the Gnome engine exercised a very marked influence on the design of heavier-than-air machines.

Modern air-cooled aero engines are generally of the radial type and in spite of the high head resistance of these engines as compared with the straight vertical or "V" type, their low weight for power, concentration of weight, ease of mounting and accessibility make them very suitable power units for various types of machines. The Bureau of Aeronautics of the U.S. Navy have made air-cooled engines standard equipment for all powers up to 300 B.H.P.

The reliability and durability of engines of this type have been demonstrated by various long distance flights and by special endurance trials. About a year ago a machine fitted with a radial air-cooled engine flew about 25,000 miles in a total flying time of about 226 hours, the test being carried out under continuous supervision. During the test the engine was sealed. At the end it was stripped and one exhaust valve and one spring were replaced after which the engine was again ready for service. The test was carried out at about 75 per cent. throttle. While it is true generally that an air-cooled engine offers greater possibilities as regards weight cutting than a water-cooled one, yet an example of the latter type ranks among the lightest aero engines yet produced. The head resistance of a vertical or "V" engine is considerably less than that of a radial and allows a narrow fuselage to be used, and generally its fuel and lubricating oil consumption is less, so that for long distance flights the combined weight of engine and fuel and lubricating oil is probably less for a machine fitted with a water-cooled engine than for a machine of equal capacity fitted with an air-cooled unit. For short flights the advantage generally lies with the air-cooled equipment.

There are of course advantages which the air-cooled engine possesses by virtue of its freedom from failure due to possible operational or functional faults of a water-cooling system.

The great efforts made by aero engine designers and constructors to improve the performance of their productions have been attended with

very considerable success. Engines of between 400 and 500 B.H.P. are now built of weight less than 2 lbs. per B.H.P., petrol consumption of .49 lbs. per B.H.P. and brake mean effective pressure of about 135 lbs. per sq. in.

The efforts made to improve the economy of petrol aero engines have resulted in higher compression ratios being used than are suitable with aviation spirit with the result that a benzole mixture or a "dope" is necessary in order to prevent detonation. This complicates the problem of the fuel supply for these engines and may have a very unfortunate effect in case of hostilities particularly if supplies of benzole are not available in the various areas of operation of aircraft.

Although the advances which have been made in the performances of heavier-than-air machines as regards reliability, speed, climb, etc., have been made possible by the great improvements in petrol aero engines yet, in view of the greater fire risks which attend the use of the low flash point fuel, it would appear that engine developments may not be regarded as in any way final, particularly in the case of aircraft used for war purposes.

In the case of the aircraft for naval purposes the necessity for the storage of petrol in warships is evidently a matter for concern and, under war conditions, for some anxiety. For Service aircraft at least, there are therefore cogent reasons why great efforts should be made to produce aviation engines suitable for use with heavy oil and comparable in performance with the present petrol aero engines. It is proposed to examine the question in a little detail.

As such a "compression ignition" engine has a high compression ratio in order to obtain the necessary high temperature to ignite the fuel at the end of the compression stroke, it follows that a higher thermal efficiency is possible than with a petrol engine and this should be reflected in the lower fuel consumption. This result is achieved in practice and such engines give fuel consumptions of approximately .4 lbs. per B.H.P. as compared with .49 lbs. for petrol engines. We see therefore that with a machine fitted, say, with one 500 B.H.P. engine an hourly saving of about 45 lbs. of fuel may be anticipated.

The scantlings of many parts of the engine are determined by the maximum pressure which can occur in the cylinders, while the power is determined by the mean pressure. We see therefore that weight for power developed is some function of the ratio $\frac{\text{maximum pressure.}}{\text{mean pressure.}}$

Taking typical examples of modern engines of the two types, we get for the compression ignition a maximum pressure of about 800 lbs. per sq. in. and a brake mean effective pressure of 110 lbs. per sq. in.

For the petrol engine the corresponding figures are 650 lbs. and 135 lbs. so that the ratio $\frac{\text{p. max.}}{\text{p. mean}}$ for a possible compression ignition engine is to $\frac{\text{p. max.}}{\text{p. mean}}$ for an aero petrol engine as 1.5 : 1.

Due to lower mean effective pressure the cylinder diameter of the former would be 1.13 times the latter thus increasing the overall length of the engine with a necessary increase in weight if the same stiffness of crank shaft and crank case is to be obtained.

The slight increase in cylinder pitch would give the necessary additional crank pin and crank shaft bearing surfaces for the higher maximum pressure on the piston.

The amount of this increase in total force in the crank pin would depend on the piston acceleration and deceleration observing that the inertia force necessary for the reciprocating parts decreases the pressure obtaining at the beginning of the stroke and increases the pressure at the end. It may be found possible to proportion the masses so that the maximum inertia pressure is about half the maximum gas pressure, in which case the intensity of the loading of the bearings need not be greater in the compression ignition engine than in the petrol engine. One governing factor will be the maximum engine revolutions which can be allowed, which may be decided either by the maximum efficient rotational speed of the propeller or by the ability to maintain the required mean effective pressure, or a combination of both considerations.

While it is impossible to estimate the minimum increase of weight due to the substitution of a compression ignition engine for a petrol engine without detailed design and calculation, it would appear that the increase would not be prohibitive having regard to the better fuel economy. It is reported that an Attendu 2-cylinder heavy oil engine of 125 B.H.P. has been built on a weight of 3.5 lbs. per B.H.P.

Naval Air Requirements.

It is a matter of great difficulty in a paper of this character even to indicate the wide-reaching effects on war material which have so far resulted from the successful solution of the problem of flight—the possibilities of the future are immense. At the present time, large aircraft carriers are specially and entirely equipped as tenders for the efficient operation of flying machines at sea. In addition, machines are accommodated in other units of the fleet.

With regard to the necessity for aircraft carriers, experiments were made before the war, having for their objective the provision of a machine capable of getting off the surface in a moderate sea, to be sufficiently robust to be handled by the main derrick for hoisting in and out, and to have easily stowed or removable wings to facilitate this operation. The attempts were unsuccessful at that time due probably to two main causes:—

(*a*) The $\frac{\text{lift}}{\text{drift}}$ ratio was too small.

(*b*) The highest powered engine available of a suitable type was capable of developing only 80 B.H.P.

Could a machine be produced possessing the qualities mentioned above, and capable of fair aerial performance, coupled with a good range of action, the necessity for the provision of aircraft carriers would require reconsideration.

These later remarks have been largely prompted by having had some connection with the experiments referred to, and are made in the hope that some fruitful observations may be offered on this matter in the discussion on the paper.

FUEL.

It is obvious that large supplies of liquid fuels in their various forms are essential if the fighting Services are to exercise their functions. If, in addition, we consider the extent of the use of petrol-driven vehicles for the distribution of the necessities of the life of the general population and for amenities which have almost become necessities, it will be obvious that, to maintain any war, we must be assured of very large and regular supplies of fuel to the theatre of war and to the British Isles. From accounts relating to the "Trade and Navigation of the United Kingdom," we see that in 1924 we imported about 465 Crude, 385 Fuel Oil and 422 million gallons of Motor Spirit. That this quantity is rapidly increasing may be appreciated when it is stated that the consumption of petrol alone in the United Kingdom has increased in the past five years by nearly 300 per cent.

As regards the Mercantile Marine, Lloyds Register states that for 1926 the heavy oil-propelling machinery under construction in the United Kingdom totalled 184,000 I.H.P. out of a World total of 515,000 I.H.P. and that the motor-propelling engines on order for the World's Shipping for 1927 totalled 1,281,600 I.H.P. In addition, a considerable quantity of merchant shipping is fitted to burn oil in their boilers. We see therefore that dependence on petroleum for essential services is becoming more and more complete.

While the extent to which internal combustion engines are fitted as the propelling plants in the Mercantile Marine will be largely determined by economic considerations, yet the increasing requirements of petroleum are so evident that they cannot be lightly dismissed. The steam coal displaced has no alternative market at present, and our national economic position is detrimentally affected in peace time, as instead of selling coal for foreign shipping we have to buy oil for our own with the resulting disturbance of the balance of trade. In case of hostilities, the effect is even more adverse as the power we exerted in the last war by rationing coal exports will rapidly vanish as foreign shipping becomes more and more independent of coal, and we in turn will be liable to external control by our dependence on foreign sources of supply of oil. A brief analysis will therefore be made of the present and possible future sources of fuel.

To-day, about 62 per cent. of our oil imports comes from the American Continent, and less than 4 per cent. is obtained from a part

of the British Empire—Trinidad. Persia supplies about 26 per cent. and comparatively small quantities are received from the Dutch East Indies and Russia and Roumania. For some time past there has been a considerable public opinion in the United States that the internal requirements are increasing so rapidly in relation to the home supplies in sight that consideration may require to be given to a restriction of exports of oil, if not to a complete stoppage. While the question of the early exhaustion of oil supplies may or may not have a real foundation, yet it is always possible that a very considerable decrease of our American supplies may take place even in peace time, and might, under certain conditions, cease.

During the past few years, the quantities received from Persia have steadily increased, but as we have no real physical control of this source of supply, there is no guarantee of maintenance in peace, as internal conditions may considerably affect the question. The possibility of a complete breakdown of the pipe line in war is very real. It is here assumed that the problem of effectively protecting this line would be very difficult even though Persia was neutral or actively supporting us. We see, therefore, that, unless we can produce either substitute fuels, or discover big sources of supply within the Empire, our position in normal times is not satisfactory and, in case of war, might be precarious.

There is no evidence available at present which encourages optimistic views as to the probability of discovering large natural supplies of petroleum within the Empire. A source of home production is the Scottish shale industry, and in the past, fairly large quantities of crude oil have been obtained from that source. With the low prices which have ruled for oil in recent years, and the falling price of ammonium sulphate, the financial condition of this industry has become precarious. The report of a Court of Investigation in Glasgow indicated that, unless conditions materially altered, the industry would have to close down or obtain outside help.

Low Temperature Carbonization of Coal.

The most promising source of supply of alternative liquid fuels is the low temperature carbonization of coal.[1] Coal carbonized at a temperature below 600° C. produces tar from which motor spirit and heavy oils can be obtained by distillation, also a coke with a high volatile content which can be easily ignited and burns freely, gas of high thermal value from which motor spirit can be extracted by treatment with oil, and ammoniacal liquor. The process is therefore attractive in its possibilities, but the actual problem of low temperature carbonization is not a simple one. Many types of retorts have been tried and several are under trial. While a short trial may be sufficient to demonstrate that a process should be commercially successful, some years are necessary

[1] Vide "Production of Oil from Coal—The Low Temperature Distillation Process." R.U S.I. Journal, February, 1926, p. 141.—Editor.

to prove the final success of a plant. It may be stated that no commercial process has yet been proved, though some at present in various stages of development show promise.

It is to be noted that anthracite and hard steam coals are not suitable for carbonization owing to the small tar yield.

When a commercially successful process has been evolved, if all coal now used for domestic purposes be treated, about 100,000,000 gallons of motor spirit and about 1.5 million tons of heavy oil would be produced as a contribution towards our annual requirements; but a considerably increased output of coal would be necessary if most of our fuel requirements are to be met from this source. In addition a good deal of the industrial coal could in all probability be treated before use. The large coke produced is a good substitute for coal for burning in an open grate and the smaller coke can be used for pulverised fuel. The matter is of such importance that, if an economically successful low temperature carbonization process be evolved, a strong public opinion should be created that the burning of raw coal in an open grate is a threat to the security of the Empire.

A by-product of the process is gas of high thermal value, very suitable for mixing with ordinary town gas, and thus allowing an increased production of gas of lower thermal value at ordinary gas works. It is the opinion of some that an economically effective use of this low temperature produced gas will be a considerable factor in the development of an economically successful low temperature process.

Benzole is a suitable substitute for petrol or to mix with it. It is estimated that about 20 million gallons of benzole are produced per annum in the United Kingdom from coke ovens and gas works, although at the end of the war, when every possible means was taken to recover as much benzole as possible, nearly double that output was being obtained. In any case the requirements for the manufacture of explosives would probably leave little benzole available as fuel.

Power Alcohol.

Various committees have sat on the question of the possibilities of increasing the production of alcohol within the Empire for use in power production, and a small permanent organization under the Fuel Research Board was constituted in 1920 under a Power Alcohol Investigation Officer. As far as the United Kingdom is concerned, the opinion expressed is that the production of alcohol in any considerable quantities from vegetable materials which can be grown was not commercially feasible owing to high cost of production, limited acreage and also to the fact that the most suitable materials are foodstuffs.

The possibilities of alcohol production in the Empire overseas are more favourable as regards meeting local requirements; in Natal and British Guiana considerable quantities are being produced from molasses.

A factory is being erected in Queensland with an anticipated output of 500,000 gallons a year from waste molasses. The production of Industrial Alcohol is being revived in Canada, the raw material being black strap molasses imported from Cuba.

Production is also taking place in India. But as a possible substitute for petrol, or even as a means of economizing petrol by mixing it in considerable proportions, it may be generally stated that alcohol cannot be produced from vegetable matter in such quantities as to make it generally available for power purposes nor can it be produced at a favourable price except in some special cases overseas.

According to the *Times* correspondent, however, the Badische plant, using the Fischer synthetic process for the production of methyl alcohol from coke, continues to make headway in Germany, and although it is difficult to gauge the extent of the industry, the rate of production at the end of 1926 was about 20,000 tons per annum, or enough to cover the German home industrial demand. This synthetic methyl alcohol has been exported to the United States at a price lower than that charged for methyl alcohol produced locally by the destructive distillation of wood. While its price is satisfactory for industrial purposes, it would probably be too high at present for use as a motor fuel, but further developments may lead to production at competitive prices.

A factory is being built in France for the production of methyl alcohol by the Audibert process with an estimated output of about 500 tons per annum.

Alcohol is a suitable motor fuel mixed with petrol, but a third liquid is necessary if more than a small proportion of alcohol is to be mixed. Benzole is a suitable third liquid, and a mixture can be made containing 40 per cent. petrol, 20-40 per cent. alcohol and 40-20 per cent. benzole respectively, which will remain homogenous within normal limits of temperature.

The Bergius process for the production of liquid products from coal by hydrogenation is under investigation at the Fuel Research Station at Greenwich, where the erection of a plant for dealing with about one ton of coal per day is nearly complete. It is claimed that a net output of abour 100 gallons of crude oil per ton of coal can be obtained by this process. Whatever may be the likelihood of success from the technical point of view, it is significant that Dr. Bergius has uttered a warning against exaggerated hopes and has pointed out that oil produced from coal would never be able to compete with oil obtained from wells. Two large factories are being erected in Germany for coal liquefaction by this process. The estimated annual throughput is 100,000 tons of coal.

There is a process in the large scale laboratory stage for the conversion of water gas into a mixture of liquid and solid paraffin hydrocarbons, closely resembling Pennsylvanian petroleum. This is a new process devised by Fischer and Tropfsh. The gas, purified from

sulphur, is converted by catalysis at a temperature of 400° C. and a pressure of 75 atmospheres. The catalysts used are mixtures of oxides of iron and cobalt or copper. It is claimed that the proportions of the lower and higher boiling paraffins can be altered at will by suitable choice of conditions. It must be emphasized that the process is in the laboratory stage, so that its possibilities as a successful economical means of producing a substitute range of oils cannot be estimated.

Conclusion.

The conclusion to be reached from a consideration of the foregoing facts is, I think, that, although there are a number of processes in various stages of development which may eventually provide ample supplies of commercially competitive substitutes from materials available within the Empire, yet it is not possible at present to predict a time when the Empire will be self-contained as regards fuel oils. Until that condition is reached, the temporary solution would appear to be the provision of ample reserves in suitable positions.

I think it will be agreed that the subject I have been asked to deal with is so extensive that it is impossible, within the compass of a single paper of reasonable length, to give much more than superficial consideration to the numerous applications of internal combustion engines for Service purposes.

DISCUSSION.

Wing Commander T. R. Cave-Brown-Cave, C.B.E., R.A.F.: I agree with the Lecturer's view that the ratio of the maximum to the mean pressure developed in the cylinder is the correct basis on which to deduce the weight of a compression ignition aero engine from one using petrol. This comparison only applies rigidly to certain parts. The weight of the injection system is much smaller than that of the magneto, carburettors and induction pipes of the petrol engine. The great difference lies at present in the speed of revolution. The petrol engine often turns at 2,000 r.p.m., whereas, the compression ignition type does not at present exceed 1,200 at high power.

An increase of speed would be beneficial to the compression ignition engine for many reasons. The only thing which at present limits the speed is the time taken for the charge to burn in the cylinder after injection. Once vigorous burning has started it proceeds rapidly, but the difficulty lies in the initial hang fire.

The power of a petrol engine can be greatly increased by supercharging or pre-compressing the charge so that more is taken into the cylinder. Similar superchargers applied to a compression ignition engine will similarly increase the amount of air introduced into the cylinder and, therefore, the speed of burning and amount of fuel which can be burnt. The amount of pre-compression possible with a petrol engine is limited by detonation, but there is no corresponding limitation when air only is compressed. The gain by supercharging may, therefore, be much greater in the compression ignition type.

This Institution is not greatly interested in technical engine detail, but it is interested in the operational value of engineering possibilities. Consider, therefore, the operational value of substituting heavy oil for petrol in aircraft, and also that of using for naval purposes oil engine of aircraft lightness. To be able to substitute for petrol, oil of flash point over 200° F., available almost everywhere,

and costing £5 per ton, as compared with 1*s.* 9*d.* per gallon, is operationally important enough to justify much expenditure on development. The oil is more difficult than naval fuel oil to ignite, and will render an aeroplane remarkably difficult to destroy.

One is often asked how one dares to talk of engines weighing, per horse power, one tenth to one hundredth of those in good marine practice. The answer is that for aircraft to fly at all, it has always been necessary to expend much more care and money in making parts light than would be justified in marine work, where the relative importance of weight and justifiable expenditure on research and design are so different. But it does appear reasonable that having, to meet the exacting needs of aircraft, paid the price for acquiring the knowledge which will allow engines to be built light, that knowledge should be used also in other branches of engineering design.

The marine engineer doubts the reliability of our engines. The engine which took Sir Alan Cobham to the Cape and back, reached Singapore on the way to Australia before a replacement so serious as a set of valve springs was required. It then finished the flight to Sydney and return to London without further incident. Admittedly it was looked over carefully at the end of each flight, but would a marine engine do as well if it were locked up inaccessible and only looked at every four or six hours.

Gearing appears to be the factor which will allow the fast, high turning engine, designed with aircraft skill, care and expense, to be applied to marine purposes. The marine engineer had to face the once difficult problem of gearing a turbine. His aeronautical brother has had to use gear to get down to a speed suitable for good airscrew efficiency. To use the same pinion and a bigger wheel to give the still slower speed necessary for naval purposes is a comparatively simple step.

I am not a super-enthusiast wishing to re-engine the " Hood " with several hundred small units, but I do suggest that for electric generators and for the machinery of boats and small craft, there is an immediate opening for aircraft engine design. Look first at a 600 h.p. aero engine and then at a modern marine Diesel electric generator and marvel how such a tiny horse-power can find its way out of such a mighty cathedral !

The way most quickly to gain advantage from aero engine design is to appeal to an aero engine firm. It must, however, be a firm which has produced many and good aero engine designs. They must be given a free hand as regards engine design and speed, and only be required to produce, with reliability, a coupling rotating at specified speed with specified power.

Is the difficulty and expense sufficient to justify the potential gain ?

The Lecturer's Reply.

With regard to the remarks that Wing Commander Cave-Brown-Cave made about naval Diesel electric generators. His suggestion that we should go to an aero engine manufacturer is worth consideration. It must, however, be remembered that electric generators in warships are required to run continuously for long periods at high output ; also that the generator must last the life of the ship. If we could accept a much shorter total life of the generating machinery a considerable amount of weight cutting would be possible.

I wish Wing Commander Cave-Brown-Cave would suggest a firm or firms who could probably provide light weight Diesel generators with the necessary reliability and durability. Messrs. Beardmore have done a great deal in this direction and a few of their engines are now used on the Canadian National Railways for branch line locomotives, and I understand that some larger units are contemplated for main line service.

With regard to his remarks on reliability I do not think that the point made as regards the amount of refitting can be applied to the main propelling machinery. The auxiliary machinery requires a certain amount of upkeep, but the amount of maintenance required by the turbines is very small. One of the great advantages of turbine machinery as a part of the fighting equipment is its small maintenance.

THE CHAIRMAN.

I am sure we are all very much indebted to the Lecturer for the most interesting paper he has given us. I will only add that there are just one or two points upon which I would like to make a few remarks. The lecturer referred to the question of mercantile engines being quite different from Royal Navy engines. It is a fact, as far as the air is concerned, that unfortunately, at the present time, commercial aeroplane engines are the same as those used for war purposes, that is the military engine. It is unfortunately the case that at the present moment there is not a sufficiently big market to develop a commercial engine as distinct from a military engine, but with the growth of commercial aviation no doubt that will come about.

From the experience we have obtained in Imperial Airways I can bear out what the Lecturer said, for we are now firm believers in the air-cooled engine; in fact I do not think we are ever likely to order any water-cooled engines again. The air-cooled engine has enormous advantages from our point of view, and it has turned out to be extremely reliable. There were on view at the Paris Exhibition a short time ago a large number of designs of air-cooled engines running up to 750 h.p. A very long time elapsed before they got up from 100 h.p. to 150 h.p., and then there was a jump to 200 h.p. in the Bentley engine, which was a rotary engine. We have now got an air-cooled radial engine. The trouble with this engine in the first place was the heating, but they have now got over that difficulty and the engine is running extraordinarily well.

One of our principal troubles which I sincerely hope that engineers will help us to overcome, is the large consumption of fuel at the present time. Anything that will help in the reduction of the consumption of fuel is a step in the right direction. That will reduce very considerably the weight we have to carry.

The question of the supply of oil fuel is an extremely important one, to which too much attention cannot be devoted. It is necessary to remember that, as far as one can gather, nobody in America can tell you how long the oil will last. There is one point that occurs to me in that connection that I should like to mention, and that is that the present way of obtaining the oil is by nature pushing it up out of the earth for you either by hydrostatic or gas pressure. Directly that pressure ceases the earth fails to produce any more oil from that particular well, and it is necessary to drill another well elsewhere. Of course it is quite possible that in the course of time we may be able to put engines down to pump up the oil, because it is quite certain that the oil is down there and has not absolutely gone. The subject is a very difficult one.

Attempts are being made to solve some of the problems by the adoption of low temperature carbonization, at which all the nations are working hard; while the French and the Germans are making considerable headway in dealing with lignite and have arrived at somewhere near a paying proposition. But in view of the continual increase in the consumption, the question of the future oil supply is one of the serious problems that faces the world at the present moment.

A hearty vote of thanks was then accorded to Engineer Captain Phillips.

At the call of Engineer Captain Langmaid, R.N., a hearty vote of thanks was accorded to the Chairman.

MECHANIZATION FROM A CAVALRY POINT OF VIEW

By MAJOR E. G. HUME, 18th King Edward's Own Cavalry.

THE majority of opinions regarding mechanization, hitherto published, all seem to express the Tank Corps or Infantry points of view. There is, moreover, a tendency to regard all mechanical arms as " Tank Corps," and not to differentiate clearly between the separate specialist roles which may fall to their lot in war.

Now many cavalry officers do not agree with so drastic and sudden a manner of thought. They are convinced that a more correct solution of the problem of mechanization would be to introduce a proportion of the latest light mechanical weapons into cavalry units and formations as an integral part of their organization so as not only to endow our cavalry with the mechanical support now essential to it in modern European conditions, but also to afford the best and most complete opportunity of testing these weapons. By these means cavalry may of itself evolve its own re-organization and modify its tactics as may become necessary as the result of the use of mechanical aids.

There has also come to light in some quarters far too great an inclination to regard cavalry as an unchanging and somewhat obsolescent arm, and to look to the Royal Tank Corps to evolve something that will take its place. Granting that there should take place at some distant date a change in the conditions of war, a development of machines and of methods of production, and a pause in the progress of mechanization resulting from our approaching a stage of relative perfection in design and in performance—which might mean that the machine should eventually replace the horse—still the role of the mobile reconnoitring arm will probably remain much the same. Accordingly, is it not quite reasonable to claim that our present mobile reconnoitring arm, " cavalry," should be allowed gradually and progressively to develop into the new arm as necessity dictates, while remaining during this period of transition a really up-to-date and efficient arm ?

There should be no feeling of opposition or of destructive rivalry between two *means of mobility* ; there is nothing esoteric about machines, nor any barrier to a gradual change from horse to machine in cavalry. If and when such a step may become necessary, attention will merely be turned from horsemastership to mechanics. Surely then, the first

stage in making full use of the light mechanical arms we now possess is to give them a place in the existing arm which is responsible for the duties they are being designed to carry out? *Mutatis mutandis* the way will be paved for a possible second stage of "amalgamation," when the time is ripe. The next step will then be that, if and when the machine is found to have reached a stage of efficiency in the cavalry role sufficient to justify its general adoption in place of the horse, the merging of cavalry into the purely mechanically mobile arm will be gradually and rationally carried out. This process will involve the all-important consequence that there will be a corresponding adaptation and development of sound tactics for the new arm.

It is proposed to discuss the first or present stage of the problem. We will suggest, in the first instance, that possibly one section of four armoured cars should form part of each cavalry regiment and that in addition one "troop" of, say, eight light tanks should form a part of each cavalry brigade. When working as a brigade the regimental armoured cars could, when necessary, be concentrated under brigade control, just as machine guns. These mechanical units would, in this first stage and for some time to come, remain Royal Tank Corps, as now happens with Royal Horse Artillery. That is, their recruitment, *technical* training, provision of equipment, would be the charge of the Tank Corps, whereas their *tactical* training and non-technical administration would fall to a cavalry formation. It is not suggested that, at present, a particular section of armoured cars or "troop" of tanks, should permanently remain with any one unit, but that there should be created a specialized cavalry branch of the Royal Tank Corps supplying the mechanical needs of cavalry, just as is done by the Artillery.

It might even be urged that armoured cars are so suited to co-operate with the cavalry regiment, whether brigaded or working by itself, that they should be considered as a regimental rather than as a brigade weapon; even in spite of the increased difficulty of technical training and inspection that this might entail. For it is only by the actual absorption of mechanical arms into the cavalry *unit* that the seeds of a thoroughly blended "point of view" and doctrine can be sown. This process can alone lead to a healthy, vigorous, yet gradual development of new ideas on rational lines tested by actual experience. For this reason it would be preferable, when necessary, to brigade the regimental armoured cars, rather than that a brigade "troop" of armoured cars should be the normal unit, and that sections should be detached from it to regiments on emergency as a temporary measure. The question as to whether Royal Horse Artillery should not be mechanized, and, if mechanized, what relationship it will bear to the Royal Tank Corps will also require consideration; in any case the cavalry light tanks and a proportion of armoured cars should be armed with an anti-tank gun.

The manœuvre of large cavalry masses has proved to be impracticable under modern European conditions. What is now required for reconnaissance is a powerful mobile screen with great offensive and defensive power, furnished with first-class means of communication; so that, while efficient and wide reconnaissance is made possible by dispersion of units having in themselves considerable offensive and defensive power, and capable of keeping touch efficiently with each other, rapid concentration in any direction when enemy main forces are located will be possible owing to efficient communications and greatly increased mobility. This should be possible, since inter-communication will be very much facilitated by the possession of mechanical vehicles which can be fitted with wireless:

It is generally admitted that the opening "ground" phase of any future European war will probably resemble, broadly, the conditions under which the Great War started, that is:—

(1) Hostilities will be on a wide front;
(2) There will be an attempt by one or both sides to achieve the initiative by carrying the war into the enemy's country on a sufficiently large scale to paralyse his initiative for the time being elsewhere;
(3) During this opening phase the "fog of war" must prevail, and there will be wide areas in which definite reconnaissance will be of vital importance.

We may therefore assume that operations during this phase may be grouped into three main areas:—

(i) An offensive area where every effort is being made to gain the initiative;
(ii) A defensive area, where for geographical or other reasons no great activity of either side may be expected during this preliminary phase;
(iii) Areas where an enemy offensive on a large scale is possible.

If the initiative is to be achieved without risking disaster there must therefore be:—

(*a*) Reconnoitring forces, possessing great mobility and range of action combined with great delaying power;
(*b*) A large striking force, endowed with the maximum of mobility and offensive power;
(*c*) A covering force, grouped possibly behind obstacles, natural or otherwise;
(*d*) A strong and mobile reserve which can be moved rapidly as required to exploit success or to any danger point.

In (*a*) (*b*) and (*d*) there will be urgent need for the mechanical arms. Yet, even supposing machines can work efficiently by themselves, is it reasonable at the present immature stage in the development of the machine, to count on there being a large enough purely mechanical force

instantly available on the outbreak of war to carry out these three mobile roles? In addition, we must always allow for adequate reserves to make good the great mechanical wastage that must occur in mobile war. Moreover, the perfection of artillery and of mechanical weapons themselves has to an enormous extent increased delaying and defensive power, a fact which will render it very difficult to push through a mobile offensive quickly unless enormous reserves of mechanical vehicles are available for instant replacement. Will not the side, therefore, which possesses large mechanically strengthened " man power " forces, and is able, in the first instance, to keep the greater part of its available " tank " power in reserve for a few days, or until the strategic situation is clear, have a great advantage at the decisive moment over the side which, by the time that this moment arrives, has already used up the bulk of its mechanical forces in long-distance running?

Had von Kluck's army been mechanized and had Maunoury's army also been mechanized, would not von Kluck after, say, 200 miles running, a considerable part of which would have been cross-country work against opposition, have suffered disaster, owing to mechanical inefficiency and difficulties of supply, on meeting Maunoury's army, concentrated comparatively at leisure in a favourable area, and tuned-up to the highest pitch of mechanical efficiency?

Looking ahead for some years to come must we not then concentrate on strengthening in every possible way our " man power " forces by providing them with their own specialist mechanized arms, as well as with motor transport? Is it not with these forces that a situation suitable for the decisive use of an army's main " tank " power will have to be prepared? It is not suggested thereby that the initiative should be allowed to pass to the enemy, but that the bulk of a modern army and its mobile reconnoitring forces must for some time to come be composed, primarily, of mechanically strengthened " man power " units and that the major portion of mechanical " crushing " power must be kept for use when a situation suitable for its really decisive use has been created.

If this is the correct view, the necessity for " cavalry " will be more than ever great; if so, then the mechanical strengthening of cavalry *on cavalry lines* becomes more than ever urgent. And this need is the greater, if it be remembered that the demand for speed and accuracy in reconnaissance has greatly increased in modern war, while neither cavalry nor mechanical arms can, or will, work efficiently by themselves. Efficient co-operation between them can in fact only be attained by their association *as part of the same arm.*

Let us therefore concentrate on re-organizing our cavalry units and formations by strengthening them mechanically so as to bring them into line with modern conditions rather than try to evolve *ab initio* a mechanical reconnoitring arm under non-cavalry officers and apart from cavalry.

The one may excel in mechanical skill, the other in tactical ability. Both will be needed in combination on the battlefield of the future.

THE U.S.A. NAVAL WAR COLLEGE

By Rear-Admiral W. V. Pratt, U.S. Navy, *President, Naval War College.*

[*Being extracts from an article of that title and by the above author that appeared in the Proceedings of the United States Naval Institute for September*, 1927].

I.—The College to the time of the World War.

DURING the first twenty-five years of the College's existence the names of three men stand out above all others. They have given it an indelible stamp. They are Admiral Luce, who gave the College life and established its mission; Captain Mahan, whose works on "Sea Power" brought it fame; and Captain McCarthy Little, whose untiring devotion kept the spirit of the College alive during its most trying days.

About 1910, during the administration of Rear-Admiral R. P. Rodgers, a change in the method of instruction was inaugurated. The scope of the problem work was increased and the method of instruction was definitely based upon a practical and competitive system, similar to the case system used at some schools, but further embodying the competitive feature.

The external relationships existing between the College and the rest of the Naval Service, however, were not so satisfactory. Even in its internal work, the College had not reached the point where it was able to take up in detailed study the partnership existing between the two military establishments, or the co-ordination demanded between the military establishments and the other branches of the Government, or the relationship of the combined executive departments to the national resources of the entire country. In fact, it took the World War to clarify our thoughts and extend our vision in this direction.

The course at the Naval War College during this period partook of the following characteristics. There was given opportunity for study; the solution of naval problems under the applicatory and competitive system went on, but, in addition and from time to time, the Department, due to its faulty organization or rather lack of organization, in that most essential feature, a fully developed office of operations, occasionally threw upon the College work which properly belongs to a War Plans Division. Had the College been assigned the task of testing plans

already made, this would have been another matter and a legitimate function, but, there being no War Plans Division, the College frequently was forced to make plans and to test them, in addition to its work of education, and this was not practicable as the College was then organized. Further, the great importance of conducting studies of joint operations through the problem solving method in connection with the Army was not fully realized.

Howbeit, the work of the College had produced such good results that at the opening of the World War there was a small body of naval men who were more competent to face the complex situations confronting them, than if the College had never existed. In fact, no less a person than the Chief of Naval Operations during the World War has expressed his appreciation of the work performed by graduates and he himself was careful, in so far as he was able to do it, to place in positions of major responsibility those officers who had received the benefits of a War College training.

During the first two and a half years of the World War the College continued its courses and had the opportunity for studying the conduct of war from the point of view of a neutral.

In May of 1915, Admiral Benson was selected to be Chief of Naval Operations and with his appointment the Office of Operations, corresponding to that of the General Staff of the Army, came into existence on a practical basis.

With the establishment of that Office on a correct, though limited, footing, the proper functions of the three major shore organizations of the naval establishment become more clearly outlined. The first result was felt immediately at the War College. The character and scope of its work at once took on more definite shape. The same cannot be said of the relations which existed at this time between the General Board and the Office of Operations. A true appreciation of the partnership which should unite these two bodies did not come until some time later. In fact, it may be said to be a development of the World War.

Upon our entry into the war, the College closed and did not re-open until fully six months after the Armistice.

II.—The College immediately after the War.

After the war the College started work. It began its new life with an increased vigour. The lessons of the war were fresh in the minds of all; the value of the College had been demonstrated and there existed a definite desire on the part of officers to take advantage of the course of study offered to them. This desire was increased by departmental orders which indicated that the higher commands, so far as it might be practicable, should go only to those who had received the benefits of War College training. The classes now increased in size and the staff of the College was augmented correspondingly.

Present Scope of Work.—About two or three years ago the field of the College work was expanded further. Instead of one class, there were now organized :—

(*a*) A correspondence course dealing in the elementary study of tactics and international law ;
(*b*) A junior course, established to fit younger officers for staff duties, dealing in problems of tactics and minor strategy ;
(*c*) A senior class undertaking more extensive tactical and strategical problems.

Arrangement was made also for an additional and higher course to be established at the War College when the time should be ripe to accomplish this. The latter step has not yet been taken.

International Law.—The study of international law, carried on since the time of the first founding of the College, was continued, but the output was not as great as it had been in earlier periods of the College history. Lectures on international relations were frequently given but a division for the study of international affairs had never been created, and there was not the sound, official and correct background of national policy upon which to base our more technical naval studies.

Logistics.—Two other fields of work essential for an understanding of our country's military needs were undeveloped. The first field of endeavour lay in the development of a course in logistics, which should link up strategical and tactical movements to matters of personnel, material, supply and transport, and the further linking up of this logistic course to national resource in general in the effort to determine the relationship which must exist in war, between national resource and naval operations.

Relations with Army War College.—The second line of effort lay in linking up more closely with the Army War College in the matter of joint operations, from which the study of war operations, on a major scale naturally results, leading ultimately to closer co-operation between the College, the Joint Board and the plan making organizations.

In the last few years several joint problems have been played by the Army and Naval War Colleges working together, and a good lecture course has been established where authorities on their own subjects talked to the student officers, but an appreciation of the necessity for greater study and problem work along the lines just indicated did not exist at the Naval War College to the degree that it should. Too much thought was spent upon the separate departments of tactics and strategy and too little attention was paid to the fact that strategy and tactics are not separate fields of activity but both merge under the head of operations, and that operations, even purely naval, cannot hope to succeed unless careful attention is paid to material, personnel and the thousand detailed difficulties attendant upon war. Until a proper appreciation exists of the intimate relationship between the purely naval

operation and its attendant activities, there is little hope that a full perception will be had of the immense scope of activities necessitated by a broad plan of campaign involving both military services, and the country as a whole.

Study of the Art of War and Keeping the Peace.—The College exists for the purpose of studying the art of war. Admiral Luce used these words in his first letter, but he said war and not naval war only. This is its major purpose, but it is true likewise that between wars there are long periods of peace. The mission of the Navy is to know not only how to conduct efficient war in time of war, but, in time of peace, the Navy must know how to keep the peace! Older naval men constantly are confronted with problems of an international character which require of them accurate knowledge, sound judgment and frequently quick decision. While experience stands them in good stead, and while the service rendered by naval men in the past has been excellent, it could be bettered by the opportunity for thoughtful consideration, given at such times as an officer's services could be spared from the details of executive and administrative work. As outlined by the original Board, a knowledge of international law and of international relations is one of the prime duties of a naval officer and nowhere can he find opportunity better to equip himself for these duties than at the War College.

III.—The Present Organization and Work of the College.

The Organization.—An attempt has been made to remedy deficiencies. The proper evolution of the War College demands an increase in the scope of the work hitherto assigned and a different arrangement. The World War made the need evident, a need which may be said extends even to the Navy Department itself. As a first step, a reorganization of the Naval War College has been effected, after an exhaustive study of the principles of command and administration, with the result that the College, as it exists to-day, is organized on lines similar to that of the General Staff of the Army and the office of Naval Operations of the Navy. This means that it will attempt to formulate its problems and conduct its studies with a recognition of the fact that certain deciding factors enter into the composition of every war problem. The six principal elements to be considered are as follows:—

(*a*) Personnel, material, supply (logistics);
(*b*) Information and research;
(*c*) Movement and communication;
(*d*) Policy and plan;
(*e*) Inspection and training;
(*f*) Finance and appropriations.

Naturally in the college work where the time is devoted to study, such matters as inspection and finance, except as finance may come under the head of logistics, play a minor role, but matters of personnel, material

and supply lumped under the head logistics and such factors as information, operation, plan and policy must be given great weight.

No longer do we have a department of strategy and another of tactics, but both together form a division called movement, and this operation—movement—is dependent upon other accessory factors, such as plan and policy, logistics (which includes personnel, material and supply) and information. Therefore the College is divided into four divisions: Division A is logistics; Division B, information; Division C, movement, communications, training; Division D, policy and plan. The two classes, senior and junior, and the correspondence course fit into this organization, and place is made for the advanced course when the Navy Department sees fit to send those who have graduated from the senior class or who have done staff duty at the college.

It should be noted here that the College organization fits the basic plan of organization of the Office of Operations, and it can be made to fit in with the organization of the Fleet Staff. In fact, in the playing of each major problem, not only must movement, which absorbs strategy and tactics and which is the prime role of the commander, after plan and policy are accounted for, be considered, but the other accessory factors must be assigned their proportionate parts. The result is that before the problem can be played competitively, the commander-in-chief must be at pains to organize his staff to handle the operation of the problem logically and efficiently. To this end the organization of the College itself serves as a guide.

To sum up concisely, the student under this plan is not made an administrative factor, but he still remains a student, while the scope of his work covers not only the problems of naval strategy and tactics, but includes the subjects outlined in the reorganization.

If there was any one fact brought home by the results of the late war, it was this. No amount of brilliant tactics in the field can compensate for faulty strategical conceptions, and neither military strategy nor tactics will carry through to success unless basic principles well outside the ken of the purely military school be adhered to.

The Present Course.—The College consists of a staff to instruct and two classes called the senior and junior, numbering together about seventy-five officers. While in the problem work, the junior class still stress tactical work and the senior, strategical, the general scope of the work has been broadened. In the major problem work both classes combine. In addition to the operational features of the problem work the logistic feature is stressed, and no major problem is completely solved which neglects this important factor. Less attention is paid to individual theses, which have been cut to two, and more time is spent in committee work, studying certain selected features of a campaign, a battle, the source and supply of a raw material, or the matter of a national policy. Each committee arranges its subject so that it can be

presented definitely and concisely by its speakers from the platform, and the results of the committee findings are open to discussion. Much work is crowded into the year, perhaps too much. It would be better if certain of the students of the senior class could be selected to pass over into an advanced course for another year, while some of the juniors promoted into the senior class. No man can leave the College satisfied that he has learned all, and able to confound his less fortunate brother officer with that wise statement, "This is doctrine," in the name of which many errors have been committed.

International Law.—International law is, of course, a most important study for naval men to pursue. The Naval War College yearly has edited a blue book which comprises the international law problems given to the class for solution that year. This book has been much in demand outside the Naval Service. It has a circulation in foreign countries. Without thorough grounding in this branch of the naval profession, no officer is competent to face the complex problems which confront him constantly during the course of war, particularly in his contacts with neutrals. In times of peace he is frequently the only government representative on the spot and must act wisely and quickly.

Lectures.—The lecture course covers fairly thoroughly the field of international relations and lately it has entered the realm of economics, finance, industry and labour to a limited extent. No study of war is complete that does not embrace the subjects which, lumped under the heads of resource, management and potential strength, form the background upon which our technical problems and plans must be laid. In the matter of international relations a sound grounding in this subject is important, particularly to older naval men who must act sometimes as the temporary agent of the State Department on the spot.

We are particularly fortunate in being situated near seats of learning and institutions whose professional men gladly contribute their services. This gives us the broad outlook and the latest information in international matters. Moreover, we have lately been addressed by the heads of the various divisions, and are furnished copies of the lectures delivered to the Foreign Service School of the State Department. In return we furnish the Foreign Service School with such of our international law situations as they care to work upon.

In addition to the State Department, the College is endeavouring to make contact with other Departments through the lecture course, realizing that the Navy is not a separate entity, but one part of a whole, a whole which must work thoroughly and efficiently in case trouble menaces our country.

The Correspondence Course.—The correspondence course in the last two years has been revised and now operates under a different system. Previously, while conducted from the College, it was quite independent of the work carried on here. It was handled by an officer of the staff

who did nothing else and the problems issued bore no relation to the problems studied here. Now this officer is incorporated with the section dealing with tactics, and the problems given for solution originate with the tactical section and are reviewed by the same section of the staff which plans the tactical problems used in the course.

The course itself consists of twelve situations, six of which are in the nature of questionnaires on war instructions and six on minor problem work. It is recommended that officers contemplating entering the senior and junior classes familiarise themselves with the work by first taking the correspondence course, and in so far as is practicable, this should be made a *sine qua non* for admission to either of these two classes. The correspondence course is open to all officers in active service and, in some cases, to reserve officers. In addition, a special course in international law is open to reserve officers.

An Advanced Course.—Each year the need for an advanced course becomes increasingly evident. Without it we are going constantly over preliminary work and we are not fitting officers to undertake the highest type of work. We are behind the Army in this respect.

In time, it is hoped to extend the Naval War College curriculum by an advanced course devoted to the study and the solution of broader military problems, to the further study of international relations, and to research work, carried to a more intensive degree than has been undertaken heretofore.

Relations with the Chief of Naval Operations.—The College is not an administrative organ. Its function is educational and advisory when its advice is requested. The College is directly under the Chief of Naval Operations and as such, strictly speaking, the technical head of the Navy is responsible for the general policy of the College. With the internal direction of affairs the Chief of Naval Operations does not concern himself. This system puts into the hands of the Chief a very powerful instrument, for it is here only that adequate time can be given to test theoretically the plans and ideas which the Chief of Naval Operations may have in mind. Correctly organized and used, the College may be of immense value to the Office of Operations. The College maintains direct contact with the War Plans Division, the Office of Naval Intelligence and with G2 of the Army.

Relations with the Fleet.—It is somewhat unfortunate that the physical location of the College is at a distance from the operating ground of the fleet. This, however, is all the more reason that every effort should be made to preserve this most important contact, and there is no reason why some of the problem work here should not partake in its general aspect the character of the fleet problems. Effort is now being made to mould the work in this direction, in order that eventually theory and practice may go hand in hand. With the future development and extension of the College facilities, it should grow into an organization beneficial

in the framing and testing of problems before they are executed in the fleet, and capable of giving opinions in the form of *critiques* to the two leaders, ashore and afloat, when such opinions may be desired. In time, it should be possible to draw from the College a corps of efficient judges in the matter of fleet problem work. The present organization of the institution lends itself to this conception. It needs only the adequate staff personnel to put it into effect.

Relations with the Bureaux.—With the Bureaux, the College maintains contact in technical matters, especially with the Bureau of Aeronautics, which is in the development stage.

Relations with the General Board.—The President of the War College is *ex-officio* a member of the General Board. He sits with the full board and his opinion may be sought by that body at such times as it considers advisable.

Relations with Army War College.—We think, or attempt to think, in matters pertaining to the art of war along lines similar to the Army's way of thinking, for after all there is no difference in principle between naval and military strategy and tactics, though there are essential differences in detail. In matters of logistics it is a question of detail and not of principle that is involved. Only one feature is stressed to a greater degree than the Army would stress it and this is the matter of international relations. During the past year there has been an interchange of officers between the two colleges extending over limited periods of time.

Outside Contact.—In the past the Navy has been prone to form a limited circle turning upon itself. This is not in keeping with modern progress nor it is entirely democratic in principle. The world changes; it grows broader minded each day. Its fund of knowledge increases with the scientific advance of the age, and with the improved world contacts. As the country moves forward, so must the Navy keep pace step by step; especially in an educational institution must the intellectual concepts be revised, improved and liberalised. There is no reason why a naval officer should not be a qualified technician and broad-minded as well, unless as he advances in age he looks backwards to the details of his work, instead of forward to the broad principles upon which his work rests. This attitude of mind, the broad viewpoint, the College endeavours to present and to inculcate in its more advanced students. To do this, and in turn to present our point of view, to make others realize that a naval man is not of necessity narrow, because he is a naval man, it behoves us to qualify intellectually and to seek contact outside of the Naval Service purely. To this end, the more outside contact of benefit that the College makes, the better it is for the College, for the student body in it, and for the Service at large.

Contact with the Naval Service.—The Naval War College serves for the older officer in much the same capacity that the Naval Academy

does for the Midshipmen, that is it trains men to think accurately, act with decision and express themselves clearly upon subjects pertinent to their profession, and about which previously they have had little time to think. Contrary to what many officers conceive to be its mission, the College is not a school devoted to the instruction of line officers only. There is need and a place here for the representatives of every staff corps of the Navy. Though movement is the senior of all naval war operations, it is not the only factor, and no campaign of war can be successful which does not envisage the operation in its entirety.

IV.—Conclusion.

In laying the cornerstone of the Army War College, Washington, 21st February, 1903, Elihu Root, said :—

" Other things being equal, the officer who keeps his mind alert by intellectual exercise, and who systematically studies the reasons of action, and the materials and conditions and difficulties with which he may have to deal, will be the stronger, practical man and the better soldier.

" The same considerations which have led individual enterprise to build up our great universities and technical schools, to which the graduates of our schools and colleges resort to perfect themselves in every profession and in every branch of applied science, apply with equal force to education in the science of war. It is fitting that our Government should profit by the lesson which all its citizens have learned, that for success in any business the evolution from the simple to the complex must be accompanied by a more perfect system, a more careful selection of agents and a broader training of the men upon whom fall the responsibilities of control."

These statements are as true now as they were the day they were uttered.

CO-OPERATION OF LAND AND AIR FORCES IN KURDISTAN, 1923

A Reply to "Air Co-operation in Hill Fighting." R.U.S.I. Journal, May, 1927.

By Flight Lieutenant H. N. Hampton, D.F.C., R.A.F.

Summary of the Operations in Kurdistan, 1922-1923.

During 1921 and 1922 a Turkish irregular force had been in occupation of Rowanduz, an important centre thirty miles south of the Turco-Iraq frontier, and small detachments had penetrated south-eastwards towards Rania and Sulaimania. Under the influence of their propaganda, the tribes had become actively hostile to the British administration. Thereupon a mixed column of Imperial troops and levies, called "Ranicol," was sent to Rania during August, 1922. This column was compelled to withdraw after being severely handled. The situation during September became worse, and Turkish posts were actually established at Koi Sanjak, and on the Lesser Zab within forty miles of Kirkuk.

The re-capture of Rowanduz was essential, but operations to that end could not then be undertaken owing to the severity of the Kurdish winter and the need for re-organizing and training the ground forces whose morale was not at a high level. Turkish activities had to be checked, however, and so Koi Sanjak was attacked by aircraft on 30th September and on the following days. The Turkish detachment was thus forced to leave the town.

Throughout the winter months, wherever enemy posts were located they were immediately attacked by air. Small "levy" columns also carried out attacks on certain villages in close co-operation with aircraft. Anglo-Turkish relations became so strained that most of the forces in Iraq were moved north to Mosul, while the Turks and Shaikh Mahmud of Sulaimania were planning an attack on Kirkuk and the re-capture of Koi Sanjak.

There were not sufficient troops available for operations to be carried out simultaneously on the Mosul front and in Kurdistan, and if war with Turkey had broken out, it would have been the signal for a general rising in Kurdistan.

In order to restore the Kurdish situation a combined air and ground operation was ordered, using both Imperial and "levy" forces.

Two columns were formed :—

(*i*) An Imperial column, named *Koicol* comprising :—
3 Infantry Battalions ;
1 Pack Battery ;
1 Company Sappers and Miners ;
Signal Section, with R.A.F. W/T mobile pack set ;
Field Ambulance ;
Mobile Veterinary Section ;
Train.

(*ii*) A " levy " column, named *Frontiercol*, comprising :—
3 Infantry Battalions ;
1 Section Pack Battery ;
1 Machine Gun Company ;
R.A.F. W/T mobile pack set.

(*iii*) The Air Forces for these operations were based on Mosul, Kirkuk and Arbil.

Both columns proceeded from Mosul to Arbil, *Koicol* on 18th March and *Frontiercol* on 25th March. The former was thence directed on Koi Sanjak, which was reached on 4th April : the latter completed its concentration at Arbil a day later. The object of *Frontiercol* was to move forward and occupy Rowanduz *via* the Bejan pass, while *Koicol* had a multiple task :—(*i*) to overawe the tribes of the Rania plain, which had gained greatly in confidence after the defeat of the Rania column the previous August ; (*ii*) to prevent interference against the flank of *Frontiercol*, and to take in flank any force resisting their advance ; (*iii*) to isolate Shaikh Mahmud from the Turks.

The course of the operations was the following :—A strong position had been prepared by the Turks which blocked the path of *Frontiercol*. *Koicol* was brought forward to outflank it. The Turks and tribesmen evacuated this position and Rowanduz was entered on 22nd April.

Introduction.

The conclusions reached by Lieutenant-Colonel G. P. MacClellan in his article on " Air Co-operation in Hill Fighting " appear to be based on arguments founded on two misleading premises. The first is the assumption that the methods applied at that time will always be used in small wars, regardless of the conditions of the enemy's country, his morale, his armed strength and the strength of our air force. The second is that, although the author agrees that there is such a thing as independent air action, its effect on the morale of the enemy immediately opposed to the columns is not sufficiently emphasized.

Now, the operations undertaken in Kurdistan in the winter of 1922 and the spring of 1923 were directed against the very same tribes, backed up by the same Turks, that had defeated " Ranicol " in the previous August, when our force had lost many men, much equipment and the parts of two guns. It is doubtful whether the column that was driven from Rania described the Kurd as a " contemptible enemy." In fact, so far from our making a counter-attack, the British forces withdrew

from Kurdistan altogether, and in this sector our prestige vanished. If within seven months the Kurd became transformed into a " contemptible enemy," there must have been a reason for this metamorphosis.

Correct Use of Air Power.

Air forces as well as armies and navies must be correctly used, if every advantage is to be taken of their characteristics. This may be a platitude, but the fact remains that the possibilities of air power had not been fully explored in Kurdistan prior to 1st October, 1922, the date on which the military control of Iraq was transferred from the War Office to the Air Ministry.

A study of the forces which composed the column sent to Rania in August, 1922—the last expedition attempted by us under the earlier organization—will show that there was no concentration of air effort either in close co-operation with the column or against distant objectives. Neither can it be too strongly emphasised that the risks incurred in sending a strong column into the Kurdish Hills, and the fact that it would mean leaving Iraq denuded of the greater part of its normal garrisons, had caused the authorities in September, 1922, to abandon the idea of such an expedition even to avenge " Ranicol."

After the operations of 1923, however, the Air Officer Commanding included the following sentence in his report :—" It will be appreciated that, knowing the value of these resources [of air power], it was possible to decide that with them operations were feasible and suitable, and to carry these out with success, which otherwise would not have been attempted, and which, if undertaken, might have been found to be impracticable."

Here were two columns, " Koicol " and " Frontiercol," with their " quite undue proportion of supply animals and their attendants ; the weakness of a perimeter camp with so small a proportion of combatants to guard it ; the difficulties of evacuating the sick and wounded ; the limitations of ammunition supply " . . . being despatched on what might previously have been termed a hazardous adventure.

Would these risks have been accepted if the Air Staff had not weighed up the value of their resources in the air ? It was not good fortune alone that caused the complete success of the operations of 1923. To quote that old dictum of Colonel Henderson :—" Consider whether it is not possible that what you call ' luck ' is the result of profound calculation, and of a utilisation of moral force . . . which the official despatches do not reveal."

The problem of September, 1922, was changed by the new methods of employing the resources at the disposal of the commander.

Independent Air Action.

In dealing with the absence of tribal opposition in small wars when columns are supported by air forces, insufficient attention is sometimes

paid to the effect of the air action carried out miles away from the column itself. It is overlooked that the reconnaissance and bombing machines, although operating at a distance, play a definite part in securing the safety of the ground force.

The question is now raised as to whether sustained bombing might not spur a high-spirited tribe to retaliation. One may well reply by asking: " Retaliation—against what ? "

The Kurd, or Arab, or Afridi, cannot see much personal benefit in being attacked by an armed force which offers no chance of loot, and which gives him no opportunity of cutting up isolated detachments. The destruction of his crops, cattle and huts means the loss of the tribesman's livelihood, and the interruption of his normal life. It is not in human nature to put up with being hit without being able to hit back. At first, the fact that there are few casualties leads the inhabitants to under-estimate the new weapon. But sustained pressure has now taught them that it will be used against them swiftly and surely, wherever they may happen to be. It is by keeping the native in a perpetual state of uncertainty that air action has its greatest effect. News travels faster than a column can move, and so the tribes can prepare to resist both mentally and physically the older forms of attack; but the suddenness of a bombing raid and its power to reserve all its offensive energy for one locality leaves the tribesmen helpless.

Between the time that a Turkish detachment installed itself in Koi Sanjak in September, 1922, and the opening of the Kurdistan operations proper in April, 1923, independent air action had been used extensively on all those tribes which were harbouring Turkish posts. The morale of these tribes had therefore been constantly lowered during the whole of the six months preceding the advance of the columns. This air action was a form of attack entirely new to them. Never before had they known an enemy who not only invariably struck them in their own homes but also within a few hours of their defiance of the government's authority.

Both " Koicol " and " Frontiercol " were to work without the usual lines of communication, so it was most essential that their progress to Rowanduz should not be delayed by guerilla warfare. It is not overstating the case to say that the heavy air offensive ahead of the columns, unseen by the troops on the ground, was primarily responsible for the small amount of opposition with which they had to contend. The hostile tribesmen hesitated to attack from fear, not of the troops that could never get at them, but of the aeroplanes that were doing so continuously.

In Lieutenant-Colonel MacClellan's paragraphs coming under the heading of " protection," things difficult to explain are ascribed to " the inferiority of the enemy," while the unusual is termed a " phenomenon." This phenomenon happens continually in air warfare and occurred on other sectors in Kurdistan. To give just one example,

a " levy " battalion of " Frontiercol " advancing against a village was held up by heavy rifle fire. The situation was seen by two patrolling aeroplanes who spent the next few minutes in flying up and down the enemy's position, using their machine guns from a low height. The enemy's fire ceased from the moment the machines arrived on the spot, and the battalion occupied the village without further opposition. This is but one instance out of many.

It is probable that troops on the ground—even regular forces—have little idea of the work that aircraft are doing, even those that are working within sight of them. The infantry and artillery can appreciate a low-flying attack on the enemy immediately opposite, but it is more difficult for them to understand that the very absence of hostile tribesmen and the relief afforded from many picqueting duties are due to the protection provided by aircraft. The aeroplanes giving this protection are in really close co-operation with the column, although it may not be self-evident to the mind of the soldier who cannot see them.

Employment of Aircraft.

When judging the value of aircraft, there is a tendency in some quarters to expect the impossible. Claims are made by laymen on behalf of air power which no student of air strategy would dream of putting forward. It is sometimes suggested, for example, that we should be able to bomb every small hidden detachment that may oppose a column. No responsible person has ever made that claim for air power, but we do know that we can prevent the assembly of large forces. Again, to say that ground forces can go through hilly country without any ground protection is ridiculous, but it has been proved that air reconnaissance can save a column from many picqueting duties, because only a few hostile snipers and small parties are likely to be met.

The squadron which supplied nearly all the close co-operation for " Koicol " was composed of pilots without previous training in this kind of work. Their base at Baghdad was 150 miles away ; the advanced base at Kirkuk had no facilities such as hangars or workshops ; the nearest railhead was fifty miles distant ; and the column itself was eighty miles away. The weather conditions were very bad indeed, and pilots were constantly leaving Kirkuk in heavy rain and sleet. Their duties with the column, moreover, necessitated frequent patrols through tunnels formed by narrow valleys canopied by low-driving clouds.

Co-operation in offensive action.—There are many limitations of aircraft to which due prominence is given, but one cannot agree that communication by message dropping and picking-up is slow, even though an inexperienced pilot may sometimes make two or three attempts to collect his message. It certainly enabled the Air Officer Commanding to find a solution to the problem of " Koicol's " rations, referred to on the next page.

In no previous operation of this kind had the G.O.C. kept in such close personal touch with his column commanders. The Air Officer Commanding made many personal visits by air to the columns, and, so far from there being no opportunity of talking matters over, he was able by actual conversation to co-ordinate the work of the columns without appreciable absence from Advanced Headquarters or from Air Headquarters, Baghdad.

Protection.—One wholly agrees that it is nonsense to claim that " picqueting the hills becomes almost unnecessary if their summits are watched from the air." But, going to the other extreme, the belief is expressed that the " few infantry picquets that were employed " would have obtained the same good results " had not a single plane been present to assist." This opinion is not shared by others, least of all those who have to carry out these duties. The column commander wrote in his report: " Aeroplanes co-operated throughout the march and saved the column much hill climbing to picquet the heights."

Aircraft were absent on the first day of serious opposition, because the Column Commander had given definite instructions that no aircraft were to fly in front of or with the column on that day until definitely ordered to do so. News of the sniping was signalled by a machine flying behind the column and the waiting aircraft were immediately sent off from Kirkuk.

Information.—Information obtained from air reconnaissance must always be collated with that obtained from the ground, but much valuable intelligence was brought in by machines which they alone could have procured.

The inability of aircraft to discover snipers, which is always to be expected, must be compared with their value in other respects such as in keeping the Air Officer Commanding instantly informed on questions of major importance; in maintaining touch between the two columns themselves and the Air Officer Commanding with both; lastly—and especially in these very rough unmapped districts—in obtaining information urgently requested by the Column Commander. The latter was kept in almost hourly touch each day with the detached posts on his line of communication, each of which was supplied with constant progress bulletins and a daily postal service. No difficulty was experienced in conveying information to the proper quarter.

One of the most critical periods in the whole operation occurred when the Commander of " Koicol " wirelessed from Benawi to say that he could not proceed to Rowanduz because his lines of communication had been cut. The Bejan Pass was still ahead. Aircraft were instantly sent up to collect ration statements from each post—which they did without landing—and as the result of the information obtained, the camel convoys were re-directed so that stores sufficient for " Koicol " were made available with " Frontiercol." The O.C. " Koicol " was

informed by air and wireless that, should he be able to join the other column, there would be enough supplies for them both. The exact position of " Frontiercol " was also given. He replied saying that under such circumstances all was well and that he was proceeding. This could never have been done without the help of aircraft.

Communications.—Finally, it is stated that the communications system would probably have failed " against a live enemy." But the system was not devised for an European War ; it was organized to meet the conditions under which the columns would be working on their march to Rowanduz. Both columns were successful in all that they set out to do and suffered very few casualties.

Direct supply by air was not seriously attempted except on one occasion, and even then only as an experiment. In some districts large troop carriers landed near the columns, and their value for bringing up heavy stores was proved again and again. There were of course fewer landing grounds for heavy machines than for the lighter types.

At Serkhuma, " Koicol " found itself in urgent need of boots, barley and other articles. A Vickers Vernon was loaded up at Baghdad and flown to Kirkuk at twenty-four hours' notice. There the cargo was transferred to the bomb racks of the co-operating machines and dropped the same evening and following morning. There had been no experiments beforehand to find out how much an ordinary ration sack needed strengthening before it could be used for the dropping of supplies. Trials have since been carried out in England, with good results, to eliminate damage to sacks containing tea, flour, sugar, etc., when dropped from different heights.

Moreover, barley, boots and ghee were not the only articles dropped during the expedition. A wireless transmitter, telephones, and other electrical gear were successfully dropped by parachute ; horse shoes and saddlery reached the ground without causing any casualties ; tins of dubbin and 7,500 pairs of socks came to earth fit for further use. The author well describes the humour of the situation from an onlooker's point of view. It is hardly fair however to charge the Officer Commanding Camp with not being agile enough to avoid the downpour of boots and ghee : he is believed to have been a very athletic man !

The Cameronians suffered very severely from dysentery and an unwelcome opportunity was provided of testing the possibilities of aircraft in evacuating the sick. About 250 patients were emplaned at Girde Tilleh and flown down to hospital at Hinaidi where they arrived within a few hours of leaving the column. By avoiding a land journey of eighty miles of mountains and 150 miles of barren plains, many lives were undoubtedly saved. In the absence of aircraft, the alternative methods of travelling would have been on the backs of mules and donkeys.

Conclusion.

One cannot obtain a true perspective of the complete operation unless each phase is treated as part of the whole. To discuss only the operations taking place in sight of one column and to draw conclusions therefrom regarding the whole campaign is a failure to realise that the success of the one column in question depended on the success of operations elsewhere. The work of the squadrons taking independent action was not an end in itself. It was the contribution of part of the Air Force towards the success of the ground troops and the close reconnaissance aircraft co-operating with them.

Finally, we would add that the more the two services see of each other both at work and in games, the more certainly and easily will success come in the small wars ahead of us.

THE R.A.S.C.—ITS RELATION TO THE ARMY

By CAPTAIN H. J. COOPER, R.A.S.C.

" Tout ce qui perfectionne par progrès, perit aussi par progrès."—PASCAL.

SINCE it is impossible to account for " movements in war without comprehending the preparatory measures taken to bring them about,"[1] so it is impossible adequately to understand the creation of the administrative Corps of the Army without a knowledge of the methods by which forces were administered at the time of its creation. The references which have been made in the monumental history of the British Army[2] to the scant care which was given to administrative detail during the periods which are covered by this work, are the first evidence which shows that Britain has wasted many lives and much money in war through inattention to the simple facts of life. The provision of flour, the baking of bread, the care of animals, the provision of carts, the supply of bandages, and the methods of water supply are a few of the commoner administrative details which were considered to be beneath the notice of the ordinary soldier and statesman Though, while an officer, when he commands a regiment of cavalry, for instance, can afford to ignore such details, they become matters of vital concern when he is a Force Commander. The papers of Wellington's Commissaries show that there was rarely any correspondence between the Commissaries General and Wellington's Staff. He frequently addressed his commissaries direct, which is sufficient indication of chaos. Further, when landing on the Mondego, Wellington was forced to write out the " A.B.C." of transport for his commissaries, and to do this again in 1826, when 5,000 men were sent to Portugal.[2]

During the reaction of the period which followed the Napoleonic Wars, the army had to be protected from the nation ; thus in the records of this period it is futile to search for any indication of administrative efficiency. That the Crimean campaign was the greatest administrative disaster in British Military History (with the possible exception of the Walchæren Expedition of 1809), gives no cause for surprise. In 1858, however, the political circumstances were much different to those which obtained in 1815, and the Crimean failure was the subject of much criti-

[1] " La solution des Enigmes de Waterloo," E. Lenient.
[2] " The History of the British Army," by the Hon. Sir J. Fortescue, K.C.V.O.

cism which resulted in strict investigation. In evidence which dealt with transport and supply there is much which to-day seems to savour of imbecility. The responsibility of the Treasury with regard to food and forage, the lack of concerted arrangements for the provision and impressment of transport, the ignorance of officers with regard to animal management and transport organization, are several of the contributory causes to the failure. Thus civil expediency required that there should be no repetition of this state of affairs lest the Government should be endangered. It was therefore necessary to re-organize military administrative methods. A Commissariat and Transport Corps was formed on the principle of putting both the erring departments under one control. During the military re-organization of the years which followed, " The Control " was formed, but was soon destroyed as it was found that the chief officer had a larger task than the Commander-in-Chief.[1] Thus were the lives of infantrymen jeopardised owing to professional jealousy. With this and greater chaos was the army confronted in 1875, when the Commissariat and Transport Corps was formed.

Such, very briefly, was the state of affairs, when on 11th December, 1888, a warrant was issued establishing the Army Service Corps. It was charged with the supply of food and forage to the Army and also with the provision and maintenance of horsed transport. It was to be a combatant corps, in which all ranks were trained, firstly, to be soldiers and, secondly, in the duties of supply and transport. The officers were to be specially selected after a period of regimental service from cavalry and line regiments, also from the Artillery and Marines. A definite number of staff appointments were allotted to the new Corps and the Director was *de facto* the Quarter-Master-General's principal officer. During the decade prior to the South African War the officers of this new corps were engaged in drawing up, testing and perfecting a system of supply and transport, which would suit the needs of the Army, under Sir Redvers Buller, its sponsor. During the South African War the power to improvise was the first qualification of an A.S.C. officer, and the result was sufficient justification for the continuance of the method of drawing officers from the other arms. The succeeding years brought many changes in the army, brought to light much weakness and gave birth to many attempts to buttress the unstable edifice of a voluntary army working out of sympathy with the nation. The report of the Esher Committee, the creation of the Army Council and of a staff of three branches were powerful indications that the methods of the South African War were unsuited to the task which now lay before the Army. And this heave and swell within it was not without a repercussive effect upon Buller's infant corps. The innate conservatism of human nature found, and continues to find, congenial soil in the army, and when tended by crimps as in the days of Pitt, by non-co-operative civil and military control as in the 'sixties, and by the atrophy engendered by regimental

[1] There were also constitutional objections but they were not insuperable.

monotony as foreshadowed by Esher,[1] it flourishes as do few weeds in the human garden.

Before proceeding further with historical narrative, it now becomes necessary to investigate dispassionately the status of the supply and transport element in the army, because to misunderstand the attitude of the fighting soldier to those who are engaged in humbler pursuits is to fall into grievous error and to ignore one of the most important military problems—the employment of the failures of "G." To perform this investigation adequately it is necessary to start at some considerable distance from the object surveyed. Present circumstances of our time no longer allow the modern officer to lead the spacious life of his predecessors nor perhaps to spend his earlier years in the atmosphere in which many soldiers of high rank to-day were nurtured. The British Army was remodelled on a Continental pattern by Cardwell and still retains many Continental features; and not the least of these is the effect produced by the Continental attitude of the fighting arms to *le train*. In Russia, before 1914, in Germany, in France and in Austria, the supply and transport organizations were not officered as was the A.S.C. by Buller, but by zealous other ranks who had received commissions and by officers who "it is considered are better fitted for employment in a corps or department." After all, if this method was that upon which the military nations of the world relied for their maintenance, then it must seem to have some good feature. But the administrative needs of the army of a large colonial Empire are not met by the imposition of the Continental *train* organization. To be a successful administrator it is necessary to be a successful soldier, for it is idle to say that those who do not understand the soldier's business are well acquainted with his needs. As the passing years left 1888 further behind, and because the sponsor of the A.S.C. had closed his military career by a public denunciation of his traducers, change followed change with bewildering rapidity.

The eyes of those who saw in work with transport a relief from regimental monotony were turned to the Corps in which they could receive more pay for their labours, keep a horse, and enjoy an occasional day in the country. The system of taking specially selected officers for the Corps, partially gave place to the practice of awarding direct commissions. The growing needs of an efficient force increased the need for greater knowledge, more work, and more responsibility in the new Corps, which was also busy assimilating the experience of the South African War. But for all this extra work there were no compensating advantages. The pressure brought to bear to find administrative employment for officers unfitted for their actual rôle gradually filched all administrative staff appointments from the Administrative Corps. Thus was there little inducement for the officer of the line to leave his regiment. And also the rat of snobbery found the fabric of the Corps easy to gnaw. The business of attending to stables and to working transport, the issue

[1] "To-morrow and To-morrow." The Viscount Esher, G.C.B., G.C.V.O.

of rations, the purchase of forage, and the changing of barrack furniture savoured strongly of trade. Since the days of Marlborough this trafficking, except in loot, had been anathema to the officer and the stigma was no less now.[1] Students and much travelled officers knew the effect of all this upon *le train* of the Continental armies, and the leaven was not slow to work. To the burden of their duties the officers of the A.S.C. had to add that of continual justification of their position as officers, and as the older retired it was seen that the mantle which enwrapped them in the early days of their service had not fallen upon their successors. The progress of mechanization made it increasingly hard for the officer to keep up his most important qualification—horsemanship—and the increase in his duties kept him more frequently from the afternoon's games until he ceased almost to meet his brother officers. Thus was the gulf widened between the A.S.C. and the regiments of the line and other arms, and to-day the cumulative effect of what has been written is indelible. Co-operation between the various arms and branches is hard to attain,[2] but the interchange of officers of the fighting arms and the administrative corps is so rare as to be negligible.

Having dealt with the early days of the Corps up to the time of active preparation for a Continental war, and having touched upon the subject of the status of the fighting soldier *vis-a-vis* he who is engaged in a humbler but a no less vital concern, it is urgent to proceed to a review of the work of the Corps during the greatest war in history.

The system by which troops were maintained and their barracks furnished in peace was improved during the years between 1901 and 1914 ; also the system by which forces would be maintained in war had been devised, tested and perfected in the four or five years prior to 1914. The system had a divisional basis with Lines of Communication supplementary attachments ; it had the great merit of elasticity. The duties of the Corps were concerned with the provision of supplies of all kinds, the maintenance and replacement of horsed transport turns-out, and the provision and maintenance of mechanical transport. Also it controlled water transport, which was later given to another corps. Throughout the war these duties did not alter though the units which existed at the outset :—divisional trains, supply columns, ammunition parks, reserve parks, horsed transport, mechanical transport and supply depots, were modified during the progress of the campaign and the methods of their administration were several times revised. The system had been invented to meet the requirements of Continental war, but was adapted to campaigns in the Balkans, Egypt, Palestine, East Africa and Central Asia ; it was also found alongside the system employed by the Indian Army, and in many cases superimposed on it. Thus is the claim to elasticity justified. No instance is recorded of the failure of operations owing to the breakdown of the supply and transport services though

[1] " Military Forces of the Crown." Clode II, p. 426 (79).

[2] The C.I.G.S. at the Royal United Service Institution, 7th October, 1925.

complete immunity from error may not be claimed. One of the greatest tests to which the system was subjected occurred in 1918, when it became necessary to arrange staging convoys of lorries to maintain the force advancing to Germany in November and December, 1918. The doctrine of non-specialization did not obtain as it did in the French and German armies, largely owing to the fact that it was inadequately understood, otherwise the operation might have been organized in a lesser time.

In other theatres of war improvization on a larger scale was necessary, since railways, roads and communications on the lavish European scale were not available. Less mechanical transport was used and more animal wheeled and pack transport was necessary; in Mesopotamia there was the river available to assist in the maintenance of reserves. Also in East Africa many carriers were employed, while in North Russia the indigenous transport was impressed. It may readily be seen that during five years of war a mass of data became available concerning the supplies required for almost every draught and edible animal and for every human race on a war scale. Also invaluable information was collected concerning the operation of all vehicles of transport from the heaviest tractor and supply tank to the youngest carrier in Africa. This information was collected and partially recorded by officers who served during this period of whom only a few hundred now remain; thus much of it has been lost and but a fraction of it is available for study since no official history of the administrative corps has been compiled and regimental effort seems to have met with but scant success.

It has been shown that, as 1888 receded, changes became important and rapid, so also as 1918 recedes momentous changes are frequently seen. The problem which arose after the South African War of the suitability of the apparatus and organization of the Corps for future war arose again in 1918, and to-day has assumed formidable proportions. It is therefore incumbent to examine the future requirements of the army, the present organization of the Corps, and to deduce the method by which the infantryman can best be served.

To deal firstly with the future requirements of the Army. The rate of movement in modern war impels nations to so organize their forces that they may be easily and rapidly handled; thus simplicity becomes the basis of their organization. Reduced to the simplest formula it appears as the infantryman[1] to fight, the other arms to assist him, and one corps to serve them. Thus the chief military requirement of the future is the formation of one corps to serve the infantryman and those who assist him.

To investigate secondly the present organization of the Corps. It is divided into three parts, or rather it should be said that it has three

[1] His method of progression even if it be in a tank, car or tractor, is of no immediate importance. The word here means the man plus the weapon.

separate tasks—Supplies, Transport and Barracks.[1] In the field it has only two responsibilities[2], supplies and transport. Thus, as the Corps trains in peace it does not fight in war. The articles which it supplies form only a part of those which the soldier requires and the transport for which it is responsible forms only a part of that which is at the disposal of the Commander. It is seen, therefore, that the administrative Corps of the army is in the position of performing but a part of the duties of two separate sub-commissions whilst being at the same time responsible to the main body.

Clearly this organization is unsuited to any form of war, and has only been found possible by the lavish expenditure of money and effort. But Britain is notoriously richer in money than military administrative ability[3], and there is but little incentive after a campaign for any one, least of all soldiers, to attempt to compare administrative methods with the task with which the Army was confronted. Thus is a brake placed upon reforms and antiquated methods hedged about by a fence of inertia.

There remains now to be investigated the method by which the infantry can best be served. To have one Corps to be responsible for the whole of Supply, which is resolved into the factors of provision and transport, is the simplest method of serving the infantry and therefore of serving those who assist them, that is the other fighting arms and branches.[4] The Corps is already charged with a part of provision, a part of transport, the provision of rank and file for the Remount Department (but not the officers), and also the provision of clerks for all branches of the staff. This latter is significant. The R.A.S.C. then has only to absorb the remaining portion of transport, the stores section of the R.A.O.C., the R.A.P.C.[5], and to officer the Remount Department, and it is then able to fulfil the task designed by its sponsor—that of serving the army.

Thus the transport section of the R.A.S.C. would develop into the great authority upon mechanized transport in the Army, whether it be allotted to the Cavalry, Infantry, Artillery, Engineers or to the Auxiliary

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[1] S.T. & B. Regulations, 1923.

[2] F.S.R., Vol. I, Section 43, XII.

[3] The Duke of Wellington, K.G.

[4] It should be mentioned in this connection that since the function of the Air Force is primarily to assist the infantry whether seeking out the enemy armies or preventing them from mobilizing, the R.A.S.C. organization should supply the R.A.F. just as it supplies the Army. The expansion of this theory into the Naval sphere is left open.

[5] Many now deride the suggestion that money is a part of supplies. A glance at history will show that many commanders have found it to be a vital ration. It is only the machinations of actuaries and accountants that has enshrouded the supply of money with apparent mystery. The issue of money should be subject to the Quarter-Master-General as is the supply of food; without the first the second cannot be purchased, then must both be under one control.

Services. The design, provision and maintenance of all military transport would fall within the ambit of its activities and by co-operation with industry and the Ministry of Transport and the aid of the various arms and branches of the army it would raise within itself a consultative body which would form a military Sub-Committee of the M.T. Advisory Board. Under the orders of the Q.M.G. and in combination with a Ministry of Man Power it would form the authority governing the provision of technical personnel for the army. Since the latter is the greatest user of men in war the R.A.S.C.[1] would be charged by the Defence Council with the training and with the allotment of this personnel to the three Services.

Now the most intricate task which will confront a newly constituted R.A.S.C., will be the provision of adequate supply and transport arrangements for a mechanized force. In an extreme case it may be that a mechanized corps will be employed as the spear head of an offensive movement, but for many reasons, the chief among which is clarity of expression, the supply and transport problem of a mechanized division only will be considered. It is here opportune to digress for a moment in order to explain that revolutionary changes in the army are of rare occurrence, reliance being placed upon evolutionary methods. Whether the customary argument of *festina lente* forms a sound basis for tactical doctrine and the scale of military equipment is a question which does not fall within the scope of this essay, but in practice the lesser precedes the greater, and the slower precedes the faster. Thus from a completely foot propelled army, one proceeds to a foot army with mechanized attachments. Were it not so, then would the adjustment of ideas, doctrines and methods be even harder to insure than it is at the present time. It is considered that the examination of the requirements for a mechanized division, whilst not exhausting the ambitions of the revolutionaries, forms a sufficiently advanced subject to reconcile with the first movements of evolutionary change. And this mechanization means that the first, second and third line transport is mechanized, that the whole of the Artillery, Engineers and Signals and services are mechanized and that sufficient bus companies are allotted to the division to allow of moving the whole of the infantry. Further, that the vehicles with the exception of the tanks are of the six-wheeled variety, since the half-track machine of the Kegresse type is a commercial failure.

The elimination of the horse and the attachment of mechanized vehicles to the battalion has vastly increased the scope and burden of the duties of the regimental transport personnel. Whilst in the past the transport marched either in the rear of the battalion or with the train, in the future it may have to move under the regimental or brigade transport officer, by bounds about dusk and dawn over distances up to fifty miles in one direction. Should the personnel which man the first line transport be of the regiment or of the R.A.S.C.? On the one hand,

[1] Later to be expanded into the National Service Corps.

it may be urged that the technical complications of the mechanized first line transport are such that the officer commanding the battalion would do well to rid himself of the detail of working and the responsibility of the maintenance of the vehicles by having a transport section attached to his unit. By this means the O.C. would always be assured of the maintenance of a high standard of mechanical condition and continuity of policy with regard to his specialized transport. Also the certainty of the replacement of casualties of the personnel. There is a precedent for such action in the attachment of medical and ordnance personnel to the battalion and the dual control which thus results has not been productive of great evil. It may be said, on the other hand, that the whole of the men in a battalion should be of one recruitment, with as few additions as is possible, and that these additions should not exceed the doctor and the armourer. But the driving and the maintenance of six-wheelers is not yet a common accomplishment and the training of reinforcements within the battalion on active service would not be possible, thus there is no certainty of the replacement of casualties which will occur on an unprecedented scale during the next war. Also there are many who with the experience of the heavy artillery of the last war before them, foretell the failure of any system by which transport personnel are placed under the control of another arm of the Service. Such as these distort the true perspective—the next campaign will not be similar to the last one and the prejudices and incompetence displayed by both sides during the latter will not recur, since the mechanical ability of all soldiers will have advanced considerably. The business of the transport section will be to serve, and to serve continually in spite of all difficulties, how else can it justify its existence ? In some such manner the principle of attachment of transport sections to all arms of the Service may be established.

With regard to the Artillery and the Engineers, the facts are different and the difficulties greater. Both these arms of the Service are under the Master General of the Ordnance, and for years have been used in various technicalities from ballistics to road making. And technicalities is a word with which to conjure among the General Staff. Also their officers from their cadet days have had a definite scientific side to their training. Desirable as it is for simplicity of organization, for certainty of operation and for ease of administration that there should be transport sections n each unit of every arm and branch of the Service, the lack of co ordination between the Master General of the Ordnance and the Quarter-Master-General prevents the establishment of this co-operation. "*Tout ce qui perfectionne par le progrès périt aussi par progrès.*" It is certain that the allegation that an artilleryman must be both gunner and driver cannot now be sustained ; for ability to fire and maintain a piece of ordnance is manifestly different from the ability to drive and ma ntain a tractive instrument, be it tractor or lorry. The former is the product of a specialized training to be developed in peace and practised extensively during war ; the latter is an ever increasing accomplishment

in a highly industrialized nation. Thus on mobilization it will be a simple matter for a Ministry of Man Power to enlist and allot to the transport section of the R.A.S.C. the men required for the transportation services and to allot others to be trained in gun drill.

The position of the Engineers is in some ways similar though the reasons which may be advanced for the care of the transport which is allotted to Engineer units, being vested in the units, carry considerable weight. For instance, there are many trades which would be common to both the Engineers and the R.A.S.C. It is therefore arguable that if similar personnel are available then similar duties may be performed. As the duty of a fitter is " to fit " pieces of apparatus it is a matter of indifference as to what that apparatus is, whether it be an Engineer of R.A.S.C. charge. On the contrary, however, there is the whole technical experience which goes to show that the best results are obtained by a certain degree of specialization within trades. Those whose business it is to attend to pumping, trench digging, bridge erecting and electric light machinery, are not the best suited to undertake the maintenance and heavy repair of road transport vehicles upon an intensive scale ; but those who are so engaged may be entrusted with the care of transport vehicles which move by other methods than on wheels since many components are identical. Thus is a case stated for the attachment of a transport section to Engineer units.

Now to consider the case of a very large Tank Corps. The vehicles of this corps will be of two kinds, wheeled and track ; it is reasonable to suppose that the half-track machine as devised by Kegresse will disappear from the Army owing to the advent of the multi-wheeled vehicle. The numbers of armoured cars and tanks will vary within the theatre of war ; allow that they are approximately equal. Then the majority of the number of component parts which require to be maintained and to be overhauled are of a kind to which the transport personnel of the R.A.S.C. have been trained from boyhood. That they should be maintained by men of another corps points to faulty organization. A precedent, if required, may be found in the inclusion of a Tank Corps M.T. Company in War Establishments. The duties of maintaining and repairing the vehicles seem to devolve upon the R.A.S.C., and of fighting them upon the infantry. For the invention of a third arm there is but little justification. There is contained in Field Service Regulations a shibboleth which has given rise to much confusion and great waste of time, money and effort. It is to be found in Chapter VIII, para 43, sub-paras. (vi), (xii) and (xiv), where it is indicated that one service is not entrusted with the maintenance of transport vehicles, but several. In Armoured Car Training, 1922, Chapter XXI, there is an amazing statement : " The Armoured Car is a fighting machine and requires *different treatment* in the matter of workshops and repairs from motor vehicles such as lorries. . . ." Yet in India they are overhauled by the R.A.S.C. and in England by the R.A.O.C., but they are maintained by

the Tank Corps. *Two services are thus found to be entrusted with one function*—the repair of an armoured vehicle.

It is with these and greater difficulties that the R.A.S.C. is confronted when it endeavours to create a system by which a mechanized division may be adequately supplied. In the last analysis it is found that the transportation of a mechanized force is a highly sensitive function, and that the arrangements for its accomplishment must be entrusted to one branch of the Service and to one only. The fact that the R.A.S.C. has specialized in these arrangements for some years constitutes a great claim for it to continue with them, to absorb those which have erroneously been given to other arms and to evolve such new methods as may be necessary adequately to serve the fighting arms, even to its own expansion into a National Service Corps.

That such a Corps will be large is certain, that it will be unwieldy is denied; with the administrative staff and the executive personnel it would form the complete charge of the Quarter-Master-General. If, however, the re-organization were so far reaching as to abolish the Master General of Ordnance, and to re-establish the R.A.O.C. as the technical servants of the Artillery, it would bring the Artillery and Engineers within the control of the Quarter-Master-General—then would the infantry be even better served. The inbred descendants of the old Board of Ordnance would be removed from active interference with future war. But this digression is only justifiable in so far as it indicates the organization beside which the remodelled R.A.S.C. would work. An Army Service Corps providing all stores and supplies, furnishing and maintaining all forms of transport and training and selecting the administrative and executive officers of the Quarter-Master-General's Staff, would be a powerful factor in future campaigns. Its relation to the C.I.G.S., would ensure that all its officers were primarily trained as soldiers. Its relation to the Surveyor General of Supply[1], forms a problem which the administrative staff will be compelled to solve before the nation enters upon another major campaign.

[1] The Master General of Supply in India.

RE-ORGANIZATION OF THE FRENCH ARMY FOR WAR

(*Specially Contributed from a French Military source*).

FRANCE is busy at the present time reconstructing her military framework. First of all there came the Bill on the Organization of the Nation in time of War,[1] which passed the Chamber of Deputies, but has been greatly amended by the Senate and is not yet promulgated. Next a Bill on the General Organization of the Army passed through Parliament and was promulgated on 13th July last. In addition, the Bill on recruiting is now being discussed. The only thing yet tangible in the new military structure is thus the Law on the General Organization of the Army.

It deals exclusively with the land forces, the Navy being dealt with in special Bills, and the participation of civilians in the defence of the country being dealt with in the Bill on the Organization of the Nation in time of War.

The military problem which France had to solve, since she has not discarded compulsory service, was to ensure her security while diminishing to the utmost the term of active service. The defeat and the disarmament of Germany enabled her to go further in that way than in 1913. At the same time she has to rule a large colonial Empire, where it might be necessary for her—and experience has shown it—to send reinforcements. It seemed impossible for those reinforcements to be taken from the Home Forces for moral, political and technical reasons. Nor could they be mustered at short notice by drawing upon the colonial garrisons.

An independent force, always available, had then to be provided for. The present Bill in its Section 3 shows clearly this intricate task of the Army. This is :—

(1) To ensure the military training of the citizens ;
(2) To prepare the mobilization of men and material ;
(3) To protect that mobilization in time of war ;
(4) To furnish permanent garrisons for the Colonies ;
(5) To maintain an available force to be sent to the Colonies in case of need ;
(6) And, in case of insufficient police forces and very exceptionally, to maintain peace in the Home Country.

[1] A synopsis of this Bill has been published on page 376 of the JOURNAL of the R.U.S.I. for May, 1927.

Nobody made any objection to the enunciation of those principles, except the last, which the Socialists would have liked to have seen deleted. But the Government kept their ground and had their way. Besides, the institution of a mobile Republican Guard ("Garde Républicaine mobile"), composed solely of professional long-service men and created by the Bill passed on 22nd July with a view to maintaining the peace in the Home Country, will make the intervention of the Army for such duties much less frequent.

All the debates bore on the best manner of adjusting the apparent discrepancies between the necessities of training, mobilization, protection of the frontiers and the utmost reduction of the period of active service and consequently of the standing forces. It is not perhaps very difficult to adjust the apparent discrepancies between the necessities of training and those of mobilization. A regional organization well-devised may succeed in doing so, but the obligation of protecting the frontiers which necessitated in the frontiers districts the presence of ever-ready standing forces was in contradiction with the others.

Two systems were brought forward, that of the Government who desired to keep as much as possible of the present system of a standing Army which would serve as school and cadres to the reserves while assuring the protection of the Frontiers, and that of the Socialists who brought forward a motion doing away with the tradition of a standing Army and leading straight to a system of militia. It is the Government's motion which was adopted with slight alterations, but not without much argument.

French territory has been divided into twenty Military Commands (Régions). At the head of each one is a General Officer who in time of peace has the command of the troops and directs the administration of the Military Command. In time of war he takes the command of an Army Corps and leaves at the head of the Military Command another General Officer.

The duties of the Command are to ensure the recruiting, the military training, the military mobilization and the working of the services necessary to the Army. The Command is divided into Districts (Subdivisions de Région).

Besides this territorial organization, there are permanent forces which are composed of three kinds of troops :—

(1) The Home Forces stationed in France and composed chiefly of Europeans ;

(2) The Overseas Forces, composed of Europeans and Natives, and stationed in the Colonies ;

(3) The Mobile Forces, composed of Europeans and Natives, stationed in France and in Northern Africa.

Let us set aside the Overseas Forces and the forces whose organization and station must be adapted to their mission. It is the Home Forces

which constitute the standard forces (Forces-types) of the Army. They are grouped in Divisions at the rate of a Division per Command, which gives twenty Divisions in time of peace, including the Divisions of occupation on the Rhine. Thus, some Commands will temporarily not accommodate any Division. That state of affair may last for ever if the covering of the frontiers necessitate strong covering forces on one frontier. Special measures will however enable some troops to be garrisoned in the Commands with no standing division.

What is most important in that organization and which must be brought to light as it distinguishes the Law from the Socialist motion is the fact that the Command and the Division are entrusted to the same General Officer. Thus all is under the same authority: recruiting, training, mobilization and the troops. So it is the Regular Army which remains the Cadre of the nation in arms; on that point nothing is changed from the pre-war organization. But, with the reduction of the period of active service, the establishments will not be any longer strong enough to enable the Army to fulfil its double duty of an ever-ready garrison and of a Training School. The danger was then to go too far one way or the other, to the prejudice of one of those two essential functions. It has thus been decided that the body of troops or regiments might include units specialized in each of the duties ascribed to the Army. There would thus be in each body of troops:—

(1) Training units composed of instructors and recruits;
(2) Drilling units (unités de manœuvre) composed of soldiers having gone through the preliminary training;
(3) Exceptionally, cadres-units (unités-cadres) whichwould receive the reservists at mobilization and which would be solely composed of professional long service men. These units will exist only in the regiments quartered in the Frontier Districts.

There is nothing particular to point out in the Chapter dealing with the incorporation and the training of the men except this clause: "no recruit shall be taken away from training so as to be employed somewhere else. The term of 'active service' has been shortened but it is essential that the period passed under the colours should not be wasted in fatigue duties." Besides, the creation of a corps of military officials will enable us to reach this goal.

There is another essential point in this Law. Following the regulations establishing commands and troops are those concerning mobilization. This means the bringing up to War Establishment all the troops under the colours, to constitute fresh reserve units and to complete the Staff of the Services. Preparation for mobilization is entrusted to *Mobilization Centres*. They are entirely autonomous and may have branches. When mobilization is decreed, the Regular Army is brought up to War Establishment by the incorporation of men from the reserves and cadres and specialists are sent from the Regular Army to the Mobilization Centres to serve in the new formations. The latter are organized by the Centres.

But the most delicate problem which an Army whose peace time strength is small has to solve is the covering of the frontiers. There ies the weakness of any system of short time service or militia. In the Socialist motion the covering of the frontiers was very badly provided for. The Government's motion which has been adopted ensures it better. It follows from the explanations given by the Secretary of State for War that, in order to ensure the covering of the frontiers, the Regular Army will be reinforced with the three youngest classes from the reserve, the "disponibles."[1] Each Division will then give birth to three Divisions. The twenty regular Divisions will then get rid of their recruits not completely trained and will complete their strength with the "disponibles." Twenty others will be constituted by the "disponibles" and by a small number of long-service men and cadres from the Regular Army. We shall thus obtain in a few days a mass of forty Divisions which will ensure the covering of the frontiers.

With regards to the mobilization of the "disponibles" a question has been raised: that of the diplomatic consequences arising out of the determination of the aggressor and the attitude of the League of Nations. Some Members of Parliament have expressed the fear that this necessity of calling up the "disponibles" to ensure the covering of the frontiers might place France in a false and delicate position with regards to Geneva, but M. Painlevé refuted this objection.

In spite of the ingenuity of the new Bill, the working of the system is only possible if the regular establishments are sufficient. Account being taken of those furnished by each class called up, it seems necessary to recruit 106,000 long-service men and most of them will serve as N.C.O's—Section 49 stipulates that the present term of active service will only be reduced when that essential condition is fulfilled.

Such is the new organization of the French Army. It does not represent a complete reversal from the old principles, nor does it constitute a system of militia, but it distinctly puts the military strength of France in her reserves, as even for covering the frontiers they must be called up. It is entirely directed towards the idea of an active service lasting a year which would mean a strong reduction of the regular establishments. It is thus an organization which imposes upon France a peaceful policy. It constitutes the biggest step possible to be taken in the present condition of Europe to adjust the discrepancies between the exigency of security and the necessity of alleviating the military burden.

The new French Military Bill has naturally given rise to different appreciations abroad. Among these there is one which was particularly interesting for us, as it came from an officer of a country essentially neutral and having a tendency to prefer the system of militia adopted

[1] The "Disponibles" are men comparable to those belonging to those of "Class A" in the British Army and who can be called up without the sanction of Parliament.

by that country. It is an article published in the " Cahiers Militaires de Lausanne " in August, 1927, by Colonel Le Comte of the Swiss Army.

Though partisan of a system of militia, Colonel Le Comte thinks that the organization which France has set up constitutes a minimum under which she should not go without danger. Between that organization and a system of militia there is, without regard to France, all the difference between relative security and the absence of any security.

However disarmed Germany seems to be, or one would believe her to be, it might be very unwise to rely upon the German Reichswehr having National Defence as its only object. Colonel Le Comte thinks that the Reichswehr which Germany now possesses, is as much like the Reichswehr which the Versailles negotiators thought of allowing her, as a tiger resembles a cat. This Reichswehr, solely composed of long-service men is by its nature a force plainly offensive. For aggression, plotted in secret or for surprise offensive, there is required a strong army composed of long-service men or at least an army having permanent cadres. Colonel Le Comte finds all that in the Reichswehr and thinks that it completely justifies the French legislators in not going beyond the limits of prudence in the framing of the new organization and in not having adopted a system of militia, as according to him " France is not Switzerland ; she cannot build on the expectation of another event such as the Marne ; she must cover her frontiers and she can only do so with a peace time Army garrisoned in the Frontier districts strongly organized."

Colonel Le Comte, after having stated that " France was resolutely building up a new military structure and that those who contested it were only in the wrong," put the following question : " What must we think. Is it to the good ? is it to the bad ? " He does not hesitate to state that it is to the good, as " France's gesture is a stage on the way to moral disarmament " and to declare that others would gain in following her example if they had the same thought for general peace. He thinks that there is no question that the present reorganization follows from a spirit that is purely defensive and without any imperialistic tendency. This tendency may besides be opposed to the dynamism loudly professed in some other countries ; if one were to believe the " Messagero " which lately was the apostle of this doctrine, it constitutes the best guarantee for the very life of the world.

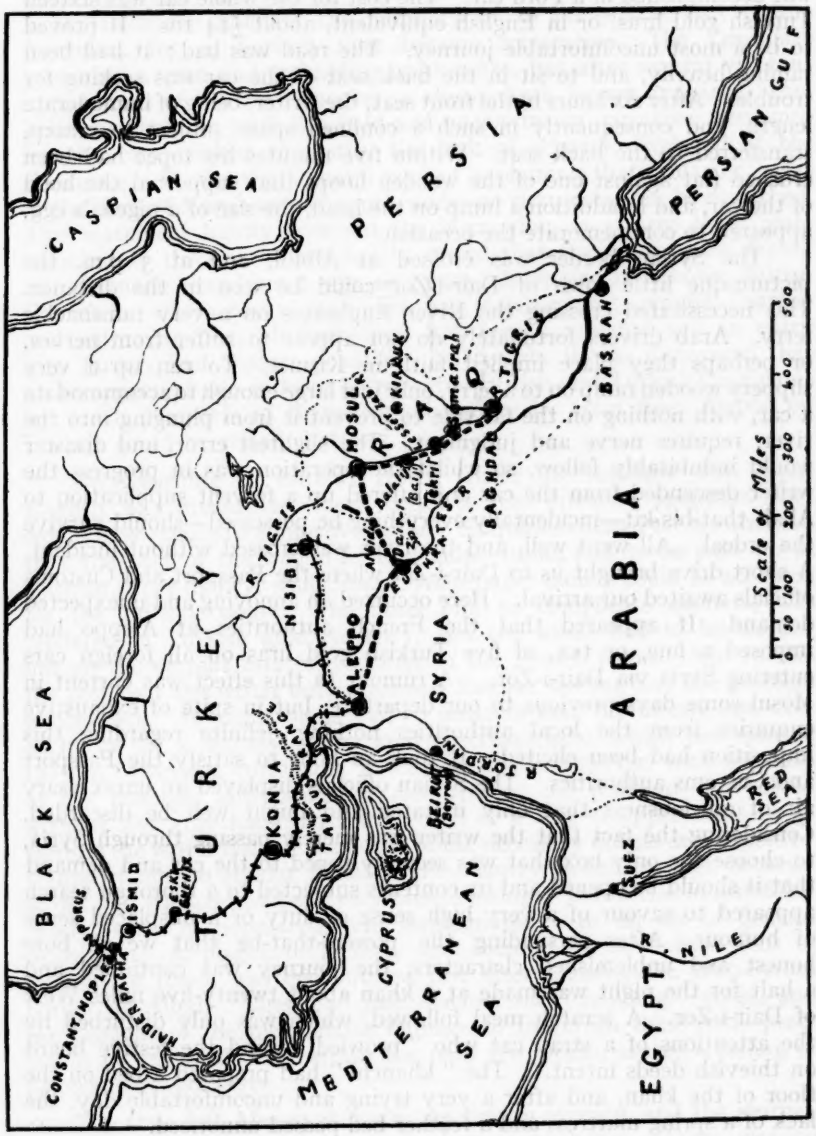
Were France's neighbours to imitate her gesture in the same spirit, the general situation would take another aspect and it would be possible at Geneva to speak more objectively of the limitation of armaments than it is at the present time.

FROM BAGHDAD TO CONSTANTINOPLE OVERLAND

By Brevet-Major W. A. Lovat Fraser, O.B.E., Indian Army

THIS journey from Baghdad to Constantinople was undertaken in May, 1927; and was carried out for the purpose of comparing the route with that normally followed from Baghdad to Beyrout through Syria.

By courtesy of the Royal Air Force the journey from Baghdad to Mosul was completed by air. The route followed the River Tigris and many interesting places were passed on the way. The golden-domed mosque at Samarrah, approximately eighty miles North of Baghdad, could be discerned glittering in the sun long before it was reached. Samarrah, at one time an important pilgrimage centre for all Shiah Mohammedans, has now almost faded into insignificance. It is the place where the eleventh and last Iman mysteriously disappeared into a cavern, and all good Shiahs believe that at the appointed hour he will reappear, and restore Mohammedanism to its former glory. It is also the railhead of the line laid northwards from Baghdad by the Germans which was to have consummated the Kaiser's dream of a through railway from Berlin to Baghdad. Tekrit and Baiji were next passed. The latter place is of particular interest, for it was from here that towards the end of 1918, our Cavalry carried out a brilliant manœuvre which involved the crossing of the Lesser Zab River. To the surprise and consternation of the Turks, our troops then appeared between them and Mosul, an act which prevented reinforcements from reaching the Turkish forces, and eventually resulted in their capitulation. Mosul, about 240 miles north of Baghdad, was reached in a little over three hours. If the town itself cannot be regarded as picturesque, the inhabitants certainly qualify for that description. A more cosmopolitan assembly it would be difficult to find. Ferocious looking Kurds, swarthy Persians, Arabs and Assyrians, to mention a few, all indescribably dirty and seemingly with no other object in life but chatting and drinking tea in a "Chai Khana" (tea shop), jostle each other through the narrow streets, each type quite distinct from the other. To see an Arab unconsciously walking along the street, clad in a lady's tailor-made coat, obviously cut in Paris or London, is a common sight, and one very quickly realizes where some of the hoards of old clothes that are disposed of in the East End of London eventually come to rest.



BAGHDAD TO CONSTANTINOPLE OVERLAND.

The journey from Mosul to Aleppo, a distance of about 300 miles, was accomplished in a Ford car. The cost for the whole car was sixteen Turkish gold liras, or in English equivalent, about £14 10s. It proved to be a most uncomfortable journey. The road was bad; it had been raining heavily, and to sit in the back seat of the car was seeking for trouble. After six hours in the front seat, the writer, being of immoderate length, and consequently in such a confined space subject to cramp, transferred to the back seat. Within five minutes his topee had been crushed flat against one of the wooden hoops that supported the hood of the car, and in addition a lump on the head, the size of a pigeon's egg, appeared to commemorate the occasion.

The Syrian border was crossed at Albidi, and at 3 p.m. the picturesque little town of Dair-i-Zor could be seen in the distance. This necessitated crossing the River Euphrates on a very ramshackle ferry. Arab drivers fortunately do not appear to suffer from nerves, or perhaps they place implicit faith in Kismet. To run up a very slippery wooden ramp on to a ferry, only just large enough to accommodate a car, with nothing on the far side to prevent it from plunging into the river, requires nerve and judgment. The slightest error, and disaster would indubitably follow, so whilst the operation was in progress the writer descended from the car and offered up a fervent supplication to Allah that his kit—incidentally everything he possessed—should survive the ordeal. All went well, and the river was crossed without incident. A short drive brought us to Dair-i-Zor where the Passport and Customs officials awaited our arrival. Here occurred an annoying and unexpected demand. It appeared that the French authorities at Aleppo had imposed a fine, or tax, of five Turkish gold liras on all foreign cars entering Syria via Dair-i-Zor. A rumour to this effect was current in Mosul some days previous to our departure, but in spite of exhaustive enquiries from the local authorities nothing definite regarding this imposition had been elicited. It took an hour to satisfy the Passport and Customs authorities. The Syrian officials displayed an unnecessary air of officiousness that only irritated and might well be discarded. Considering the fact that the writer was merely passing through Syria, to choose the only box that was securely roped to the car and demand that it should be opened and its contents subjected to a thorough search appeared to savour of a very high sense of duty or a misplaced sense of humour. After persuading the powers-that-be that we all bore honest and unblemished characters, the journey was continued and a halt for the night was made at a khan about twenty-five miles West of Dair-i-Zor. A scratch meal followed, which was only disturbed by the attentions of a stray cat who " prowled around the festive board on thievish deeds intent." The " khanchi " had prepared a bed on the floor of the khan, and after a very trying and uncomfortable day, the lack of a spring mattress and a feather bed passed unnoticed.

At 5.30 a.m. next morning we were again under way, and at 2.30 p.m. Aleppo was reached, the journey from Mosul having taken

thirty-four hours to complete. This happened to be a Thursday, and suspecting that the Turkish Consulate would be closed on a Friday, a Mohammedan holiday, the necessity of an immediate visit to the Consulate for a Turkish visa became imperative. The Consulate presented a grim and forbidding appearance, but after several vigorous applications of the door knocker, a sleepy Arab kavass appeared, who, believing that the truth is a bald and unconvincing narrative, went into lengthy explanations to justify the lack of activity displayed at the Consulate. It was the Oriental way of explaining that " Master " was in the arms of Morpheus and could, under no circumstances, be disturbed. This statement hardly bore out the inscription on a large brass plate attached to the door which boldly stated that the office hours during the afternoon were from 2 p.m. to 5 p.m. A hurried visit to the British Consulate, where every assistance was forthcoming, proved fruitful, and within an hour all formalities had been completed and an entry into Turkey had become possible. Afterwards, it was discovered that an arrangement was in force between the British and Turkish Consulates by which passports of Britishers proceeding by train from Aleppo on Fridays could be visaed that day.

On returning to Baron's Hotel, where the manager who spoke English was invaluable, there began a real intricate operation that would have puzzled a Senior Wrangler. Enquiries elicited the information that the cost of the wagon-lit to Haidar Pacha had to be paid for in Turkish paper money, whilst only Syrian paper money could be accepted for the railway ticket. The hotel bill, to complicate matters, was rendered in Turkish gold currency, and the whole had to be worked out on the current rate of exchange of the French franc. Add to this the fact that the writer only possessed English sterling and the problem is complete. It might be as well to mention that the money lost over exchange on a journey of the kind described here, which necessitated the use of several currencies, is considerable. However, with the help of the manager and prolonged calculations, the problem was solved without any grey hairs maturing; and at a cost of approximately £8 sterling the writer became possessed of the necessary tickets and papers to transport him to Haidar Pacha. The country passed through between Mosul and Aleppo had been very uninteresting. It is a flat inhospitable desert, sparsely populated, and impregnated with an air of general depression. A plague of locusts, and there must have been tens of millions of them, was encountered just after crossing the Iraq-Syrian border at Albidi. They had just reached the " hopping " stage, and the thought of the incalculable damage to the crops these little pests would be responsible for within the next few weeks, caused a feeling of helplessness and anger.

The train left Aleppo at 7 p.m. on Friday evening, and the journey to Haidar Pacha occupied exactly forty-eight hours. There was no restaurant car available, and no food would be obtained until reaching

Konia at 7 p.m. the next evening. This constituted a distinct discomfort, and careful consideration was given to the choice of food selected for the journey. The following articles, in order of value, were taken: oranges, chocolate, bread, meat paste, sardines and two bottles of Vittel. This diet proved sustaining and gave a minimum of trouble. On reaching Konia fresh (*sic*) eggs were purchased at a little shop which flourished on the platform. The writer, however, bitterly regretted his enterprise when the time arrived for exploring their contents. They could not even be likened to the curate's egg, which after all, bore the reputation of being good in parts. However, buffets existed at Eski Chehir which was reached at 8.30 a.m. on Sunday and at Ismid where we arrived at 4 p.m. the same day. The latter place bustled with naval activity, and in the Gulf of Ismid could be seen the late German battle-cruiser, Göben, and another Turkish cruiser.

The country passed through appeared very fertile and was extensively cultivated. Curiously enough the almost total absence of cultivators on the land was very noticeable, but this was probably due to the fact that ploughing and the sowing of crops had already taken place. Still, the lack of population was apparent, and it was only at the railway stations that small bunches of men and children were seen, all doubtless interested in the arrival of the train or waiting there on the chance of meeting friends. In general appearance the men looked healthy, contented, and of good physique, but there was one incongruous note, which, however, was certainly not devoid of a touch of humour. Whilst the peasants had retained their extremely picturesque national costumes of many colours and diverse patterns, the effect was completely spoilt by the addition of a very battered and dilapidated hat—obviously Western in conception—of the velour, bowler, or cap variety. The result was distinctly amusing to the onlooker, but fortunately the wearers were oblivious to this fact. It is said many humorous incidents had occurred when the order abolishing the fez came into operation in Constantinople. For example, the police had orders to arrest any person disobeying the new edict, and it was a common sight to see an offender, on observing a minion of the law bearing down upon him, snatch his fez from his head, bolt into the nearest shop that offered a choice of Western headgear, and emerge a few seconds later wearing a woman's hat of the latest style!

The snow-capped mountains of the Taurus Range were traversed in the early hours of Saturday morning, twelve hours after leaving Aleppo. The scenery was magnificent and the construction of the railway through this difficult piece of country reflects great credit on the engineers responsible for the work. Tunnel succeeded tunnel and the amount of labour required must have been enormous.

The train rolled into Haidar Pacha Station at 7.30 p.m. on Sunday evening, and then arose a fierce struggle to collect one's kit, and see it safely aboard the ferry boat that conveys the weary traveller across

the Bosphorus. Help was forthcoming in the shape of a negro guide who spoke English. Without this aid or a knowledge of the Turkish language, the difficulties would have been considerable.

The trip across the Bosphorus occupied about fifteen minutes, Then followed a short taxi ride to Pera where the writer was deposited, a tired but contented traveller, on the steps of the Pera Palace Hotel, just in time for a wash and change before dinner.

Turkish customs appear remarkably quaint to the uninitiated. For instance, when some small article is purchased in a shop, the vendor immediately breaks into voluble Turkish, presumably voicing the price. The unfortunate purchaser, not wishing to display too much ignorance, pushes a Turkish pound across the counter and waits hopefully. If he waits long enough his patience is rewarded, and a few copper coins of practically no value are grudgingly propelled in his direction. A further wait will produce a shower of nickel coins, and if really hardened, and able to withstand the pained and malignant look cast in his direction by the now thoroughly outraged seller, a half-pound Turkish note will be extracted from an old biscuit tin and flung on the counter. There are very few Englishmen of my acquaintance who are capable of withstanding the strain long enough to obtain their just dues.

The journey, eliminating the three hours spent in the air between Baghdad and Mosul, took exactly five days, and was completed at a total cost of £22 10s. This included one day spent at Aleppo, which might, by careful calculation beforehand, be avoided. The journey between Baghdad and Mosul would normally be carried out by train to railhead at Kirkuk in Southern Kurdistan, and thence by motor to Mosul, and it could not be completed in comfort under two days. An alternative would be to motor all the way which could be done in the day. Compared with the better known desert route from Baghdad to Beyrout, the journey from Mosul to Constantinople has at present many disadvantages. Heavier and faster cars than at present available are required on the indifferent road between Mosul and Aleppo; the passport and customs regulations, as well as the money question in Syria, require simplifying, while the lack of a restaurant car on the Anatolian Railways, together with the difficulties experienced in crossing the Bosphorus on arrival at Haidar Pacha, will cause the casual traveller to hesitate before deciding to face so many obstacles to a journey which under the most auspicious circumstances could hardly be described as a joy ride.

A beginning has already been made by the Turkish Government to improve matters, and it was stated that by the end of May a train ferry would be in operation by which wagon-lits will be transported across the Bosphorus, thus enabling the journey from Aleppo to Paris to be completed without a change of carriage.

A further possibility is a motor transport service between Mosul and Nisibin (the present railhead of the Anatolian Railways), a distance

of 120 miles. This would only be a matter of adjustment between the Iraq and Turkish Governments, and whilst considerably shortening the journey by motor, the difficulties encountered in Syria would also be obviated.

For travellers proceeding to Paris and London by the Orient Express, a sojourn of one day in Constantinople is at present necessary. This is essential in order to obtain the required visas, five in all. The train journey to London takes four days, so, allowing one day for the journey between Baghdad and Mosul, the whole journey from Baghdad to London can be accomplished in ten days. It is understood that an agreement is now under consideration by the countries concerned which will, if ratified, enable a traveller to obtain a through transit visa between Constantinople and Paris or London. This appears to be sensible and necessary, if the route is to be made popular, and it is hoped that the obstacles in the way will not prove unsurmountable. At present, to avoid the passport regulations, the journey by sea from Constantinople to Venice is recommended.

Constantinople is ruinously expensive to the passing traveller. In addition to the normal 10 per cent. service tax, a further entertainment tax of 10 per cent. is imposed by the Government on practically everything. Compared with Paris and London, where the prices charged are certainly not higher, the value received for money expended is very small.

THE INTERNATIONAL SITUATION

PALESTINE, SYRIA AND TRANSJORDAN

THEIR POLITICAL AND STRATEGICAL SIGNIFICANCE

By MAJOR E. W. POLSON NEWMAN, F.R.G.S. (late The Cameronians).

War Correspondent with the French Army in Syria, 1925-26.

ALTHOUGH at the end of the war the Arabs were opposed to the division of ex-Ottoman Syria between two mandatories and were strongly opposed to France as mandatory for either the whole or part of Syria, yet the Syrian mandate was given to France and that for Iraq, Palestine and Transjordan to Great Britain. A homogeneous whole was split up into four separate territories with artificial frontiers, in order to suit the policies of two European Powers.

The real reasons why France is in Syria are that she has a long-standing influence and paramount culture in the Lebanon and regards the people of this territory as her *protégés*; she wants a *point d'appui* near the Suez Canal to help to secure the position of her East African and Far Eastern colonies (Madagascar and Indo-China), as formerly the only French port between the Mediterranean and these distant possessions was Djibutil in French Somaliland; she wants more influence in the Islamic world, and thinks that she can improve her position by adding the Moslem part of Syria to Algeria, Tunis and Morocco; as a naval power in the Mediterranean she sees in the ports of Alexandretta and Beyrouth the opportunity of improving her strategic position.

The reasons why Great Britain finds herself in Palestine and Transjordan are to be found in the circumstances surrounding the Balfour Declaration, British commitments to the Arabs and Imperial Policy with regard to India. For Great Britain and her allies the policy indicated in the Balfour Declaration was most definitely a war measure, well calculated to yield results of immense importance to the Allied cause, while for Great Britain herself special reasons existed why she should adopt and support the policy of the Declaration. These may be found in the obvious advantages of covering the Suez Canal by an outpost territory, in which important elements of the population would not only be bound to her by every interest, but would command the support of world Jewry. That was the long view of British Imperial

interests, taken in 1916 and 1917. It counted for much then, but for even more after the war. Palestine was to become one of the chief pivots of British Imperial air policy as a main aerial artery between East and West. In short, Palestine was to become the " Suez Canal of the Air," which was geographically side by side with the " Suez Canal of the Sea."

But, apart from exclusive British interests, the Balfour Declaration may be described as essentially a war measure adopted by the Powers of the Entente in the furtherance of their own vital interests. It was a statesmanlike effort to prevent the incalculable and universal influence of Jewry being exerted on the side of the Central Powers—as it was, to a serious extent, then being exerted—and to transfer this highly important influence to the cause of the Entente.

Support of Zionist ambitions promised much for the Entente. Naturally, Jewish sympathies were to a great extent anti-Russian, and therefore in favour of the Central Powers, and no ally of Russia could escape sharing that immediate and inevitable penalty for the long and savage Russian persecution of the Jewish race. But the German General Staff wanted to attach Jewish support yet more closely to the German side. With their wide outlook on possibilities they seem to have urged, early in 1916, the advantages of promising Jewish restoration to Palestine under an arrangement to be made between Zionists and Turkey, backed by a German guarantee. The practical difficulties were considerable ; the subject was perhaps dangerous to German relations with Turkey ; so the German Government acted with caution. But the scheme was by no means rejected or even shelved, and at any moment the Allies might have been forestalled in offering this supreme bid. In fact, in September, 1917, the German Government were making the most serious efforts to capture the Zionist movement.

Another weighty reason why the policy of the Declaration should be adopted by the Allies lay in the state of Russia herself. Russian Jews had been secretly active on behalf of the Central Powers from the outset ; they had become the chief agents of German pacifist propaganda ; by 1917 they had done much in preparation for that general disintegration of Russian national life, later recognised as the revolution. It was believed that, if Great Britain declared for the fulfilment of Zionist aspirations in Palestine under her own pledge, one effect would be to bring Russian Jewry to the cause of the Entente. It was also believed that such a declaration would have a strong influence on world Jewry in the same way, and would secure for the Entente the aid of Jewish financial interests. It was further believed that it would greatly influence American opinion in favour of the Allies. The Declaration certainly rallied world Jewry, as a whole, to the side of the Entente ; the war was won by the Entente ; and to the Declaration as a means to that end may be attributed a share in achieving the great result. Directly and indirectly, the services expected of Jewry were not expected

in vain, and were, from the point of view of British interests alone, well worth the price which had to be paid. Nor is it to be supposed that these services rendered are to be the last. In the future Jewish support may exceed its value in the past.,

Now let us consider why Great Britain is in occupation of Transjordan. Before the war it was an established axiom of our Eastern policy that there should be a system of buffer states between the Mediterranean and India, but in the years following the war this policy entirely collapsed owing to the successful action of the Soviet Government in Russia and the assertion of a nationalist spirit in the Middle East. With the downfall of friendly Russia and with a temporarily unfriendly attitude on the part of Turkey, it was therefore found necessary to find a substitute policy by forging a chain out of the Arab provinces of the old Ottoman Empire, in the hope that, with Persia and Afghanistan independent, India would enjoy a sense of security from the menace of Russia. Whereas, formerly, an alliance either with Russia or Turkey was considered a diplomatic necessity, now it was impossible to have an alliance with either of these Powers, which may now be regarded as potential enemies. Transjordan now forms an important link in this temporary chain of buffer states, while British pledges to the Arabs on the subject of independence have been to some measure fulfilled by the setting up of the Emir Feisal as King of Iraq, and by the creation of an autonomous Arab state east of Jordan under his brother, the Emir Abdullah. Syria, on the other hand, acts as a buffer state between Turkey in the north and Palestine and Transjordan in the south. Hence, we have a regular chain of buffer states, under British influence—Palestine, Transjordan and Iraq—stretching right across from the Mediterranean to the Persian Gulf, and only one of these, Iraq, has a common frontier with a potential enemy, Turkey.

Since the conclusion of hostilities important events have taken place in the Middle East. Vast strides have been made, both in civil aviation and in motor transport. Arrangements are well ahead for the establishment of a permanent air route *via* Egypt to Mesopotamia and India, and the extension of this service to Australia is well under consideration. This alone greatly increases the importance of our Middle Eastern communications. While it is difficult to forecast exactly what changes will take place in this Mediterranean-Indian "corridor" as a result of civil aviation, it is beyond doubt that the value of this territory to the Empire will be very greatly increased, and will continue to increase in proportion to the progress made in the conquest of the air. Then, side by side with the opening up of air communications across this area, has come a great advance in the use of motor transport. A few years ago, Mr. Norman Nairn, of the Nairn Transport Company, explored the sandy spaces of the Syrian Desert, and discovered that a motor track could be blazed between Damascus and Baghdad. Although the full value of this enterprise may not yet be apparent, an entirely new route to Iraq and Persia has been opened up, which brings Baghdad within

thirty hours of Beyrouth and about ten days of London. It is also possible to reach Baghdad by way of Palestine and Transjordan, as was proved during the recent troubles in Syria when the Nairn Company used this alternative route.

When the times above mentioned are compared with those formerly taken to reach Mesopotamia by way of the Persian Gulf, some idea will be grasped of the revolution in transit brought about by this enterprising New Zealander. But the change cannot confine itself to transit alone. Its effects will be felt in all branches of life in the Middle East, and they are already being felt in Baghdad and Teheran. The Trans-desert Motor Routes are already attracting attention towards the Mediterranean, and this is bringing the people more in touch with Europe and America. All this must lead to more enlightenment among the people of the East, who quickly rise to the occasion when there is money to be made. Trade and commerce by air and motor transport are, I think, destined to follow the routes of the ancient caravans and, unless I am greatly mistaken, our future main route to India will be by the "Golden Road to Samarkand." There is also the much discussed project of laying an oil pipe line from Mesopotamia to the Mediterranean, which would constitute a third and very valuable line of communication of the greatest importance from a strategic and commercial standpoint. It is, therefore, incumbent on Great Britain to consolidate this "corridor" by every means in her power.

Yet, from the events of the last few years, it is evident that European control has stirred up considerable antagonism in Syria and some feeling in Palestine; and there is little doubt that xenophobia in the mandated territories has been stimulated by the claims of the Nationalist Party in Egypt and the policy of the late Zaghlul Pasha.

The post-war period in these countries has been one of struggling for ideals. Arab Nationalism and Pan-Islamism have fired their followers with ambitions of an "Oriental Utopia," but its realization is inconsistent with the character and nature of its promoters. Arab unity is contrary to the very essence of Arab society, disunited as it is with family and tribal feuds, and although there may be some degree of sympathy and support between contiguous areas, there is little or no cohesion between those definitely separated. Speaking on this subject last year, Sir Arnold Wilson said: "Throughout the past six years, as during the war, there never has been any real co-operation between the different peoples of Arabia; during the war their risings against the Turks were ineffectual and sporadic, except where elaborately organized by us. Since the war there has been the same absence of unity. When Syria revolted, Iraq made no move. When Iraq rose in arms, Syria failed to follow suit. When Transjordan became the scene of conflict, the Arabs across the border did nothing—and so throughout the peninsula. It has been the same since the 7th century, and we may legitimately deduce from these facts that a politically united Arabia is

not a possibility during this generation or the next, and that Pan-Islamic views—whatever they may be —are no longer a political force to be reckoned with, if indeed they ever were."

But this does not alter the fact that the Arab peoples are labouring under a deep-felt grievance and are embittered by the collapse of their "castles in the air." On Europe they lay the blame for the non-realization of their hopes. They accuse the European Allies of using them as pawns in the furtherance of their policy of imperialism and then of throwing them aside as soon as the Allied purpose was served. They regard Great Britain and France as interlopers, who have established themselves in Palestine and Syria to further their own national interests and to give nothing in return. The Moslems look upon Europeans as infidels, who have no right to encroach on the sacred preserves of Islam. In Palestine the Jews are considered alien intruders from Europe, brought in by Great Britain to exploit the country at the expense of the Arabs, who hoped for independence after their emancipation from the yoke of Ottoman rule. The presence of European officials is resented by the Arab notables, who have thereby been deprived of their old prestige, with the result that an anti-European feeling is stirred up amongst those still under the influence of these leaders, and eventually forms a general anti-European feeling throughout the land.

While in Syria the grievances are partly genuine, and this feeling is very acute, in Palestine they are mostly imaginary, and what feeling there was has greatly diminished. Yet the fact remains that Europe is not wanted in Palestine and Syria, where there is little or no independence. In Transjordan, on the other hand, where there is an independent Arab ruler and where little money has been sunk in the country by the Mandatory Power, there is considerable feeling in favour of a British Crown Colony.

Meanwhile, a campaign of varying intensity is carried on in Palestine and Syria against European influence, in the hope of effecting the eventual withdrawal of Great Britain and France, and no effort is spared to try and separate the two elements of European power. It is generally believed that the disunion of the Anglo-French combination would be a means of attaining the end in view, and in this there is a good deal to be said. Indeed, in the autumn of 1925, the rebel advance into the Lebanon very nearly succeeded in separating the two Mandatory Powers, as the rebel area extended from the Jebel Druse in the east to the source of the Jordan in the west, and the only missing link was the line of the Damascus-Haifa railway, which was held by French troops. To the west of the Jordan source there were only twenty-five miles between the rebels and the sea. As the Druse rebellion had by this time developed into a national Syrian revolt, it will be seen that the anti-European policy of separating Great Britain and France was not merely an alarmist *canard*. On the contrary, it became a very real and formidable fact that a great effort was being made by our political adversaries, and

France's real enemies, to break up the regular chain of European influence stretching from Egypt to the Persian Gulf.

It may be argued that this move of the Druse chiefs—who formed the nucleus of the rebel bands—had no serious significance, and that it was merely by chance that events took this turn. Had the revolt been purely a Druse affair, one would have been inclined to share this view, but now that Syrian nationalist sentiments were playing an important part, the mental machinery behind military action had to be judged on a different plane altogether. The Druses had no particular policy governing their operations except the desire for independence, while the Syrian Nationalist party hoped to attain its ends by forcing a breach between the two Mandatory Powers. Hence, it is essential that Great Britain and France should present a united front, for it would indeed be difficult for one to remain without the other. France in Syria, without the proximity of British influence in Palestine and Transjordan, would be surrounded by potential enemies on all sides and her position would be extremely precarious. Great Britain, without Syria as a buffer state between her mandates and Turkey, would have her Middle Eastern communications threatened in the north by a potential enemy, Turkey, which at present is little more than an unstable edifice at the southern door of Soviet Russia.

Hitherto Anglo-French relations in this area have at times been distinctly strained, and there has been much unnecessary misunderstanding. At the root of this has been a feeling of suspicion on the part of the French, founded on British support of ex-King Hussein of the Hedjaz and the placing of his son, the Emir Feisal, on the throne of Iraq after he had been *chassé* from French mandated territory. Other incidents, such as the refuge in Transjordan of those who tried to assassinate General Gouraud, and raids from Transjordan into Syria accentuated this feeling of distrust. Then, later, the appointment as Prime Minister of Transjordan of Rikabi Pasha, whom the French alleged to be hostile to their cause, made matters still worse. During all this time there seemed little attempt on the part of either side to study and understand the psychology of the other. The French logical mind could not be comprehended from the British side, and the British liberality was incomprehensible to the French. While the Arab Press in Beyrouth was muzzled, anti-French propaganda filled the columns of the Jerusalem papers. It was also most regrettable that French Intelligence Officers, relying on the reports of native agents whose personal inclination was to sow dissension, were continually led to form false deductions as to the objects of British policy. In fact, so serious did the situation in this matter become, that I felt compelled to send a strong dispatch on the subject to the newspaper I represented, and fortunately its reproduction in the Paris Press had the desired result—a complete re-organization of the *Bureau des Renseignements*. For the Latin and Anglo-Saxon to work together, a mutual effort has to be made by each to understand

and appreciate the peculiarities of the other. Fortunately this effort is now being made, not only by Lord Plumer and M. Ponsot, but also by the higher officials on both sides of the frontier. Both on the British and on the French side the absolute necessity for co-operation is being more and more realised, and it is steadily becoming the basis of a common policy in the interests of both countries. A close working arrangement with France is, therefore, a fundamental feature of British policy in the mandated territories.

Now let us consider the political factors which may create situations involving military action. These may be classed under two headings, internal and external. With regard to the former, the chief danger point is Syria where French rule is very unpopular and it needs little to provoke active insurrection. The riots on the occasion of Lord Balfour's visit to Damascus were an example of this on a small scale, while the organism more fully developed revealed itself in the recent Syrian revolt. Internal hostilities in Syria are no simple matter and, for many reasons, France had her "work cut out" even to hold the movement in check. Questions of policy, personnel, administration, supply, finance and a host of other factors contributed to the great difficulty of French operations in Syria; and few British critics have any idea of the formidable nature of these difficulties.

During General Gamelin's offensive against the Druses in September, 1925, every drop of water had to be carried at least twenty miles, the greater part of which was between the rail-head and the column. As much as 50,000 gallons a day was transported on the backs of 600 camels and in small tanks packed into twelve 3-ton lorries. The men on water supply duties worked night and day.

Although the spirit of revolt in Syria has now subsided, chiefly owing to economic causes, it must not be imagined that it has been stamped out. The Druses are a warlike people, who in the past have made a periodical habit of rising against the governing race. The Turks had to deal with these troublesome mountaineers, not once but on many occasions, and there is every reason to anticipate that the French will be again faced with the same military question which has taxed their resources during the last two years. But, while the Turks had only the Druses to deal with, the French are faced with the danger of a general Syrian revolt every time the Druses rise; and I am inclined to think that the present period of peace in Syria will only last until the next Druse rising.

On such occasions British support can only be of a moral nature, unless the situation assumes a very grave aspect, when the granting of military facilities would be, not only advisable, but essential in the interests of general European prestige. But even moral support, especially that of Great Britain, can be of great value in these countries, and has produced some important results. The newspaper report, published in London, to the effect that Great Britain was about to give France

military facilities at the port of Haifa for her operations in the Jebel Druse and round Damascus, damped the ardour of the rebels until further French reinforcements arrived in the country.

Yet even the recent revolt in Syria, serious as it was, had remarkably little repercussion either in Palestine or Transjordan, and the only instance of political troubles in Palestine having a repercussion in Syria was at the time of Lord Balfour's visit, when anti-Zionist sympathy became a pretext for anti-French hostility. As, however, antagonism between Arabs and Jews in Palestine has now very much subsided, there is little prospect of Syria being further affected by Palestine troubles. From the foregoing considerations, it may, therefore, be concluded that internal hostilities will not seriously affect the surrounding mandated territories, and that, with the exception of ordinary tribal raids in Transjordan, Syria is the only dangerous area internally.

With regard to external dangers, on the other hand, Syria has a common frontier with a potential enemy, Turkey; Transjordan, ruled by an Emir of the Hashemite House, is always more or less threatened by the Wahabis of Nejd, who have long regarded the family of ex-King Hussein of the Hedjaz as their natural enemies; and the whole area of the British and French mandates (Iraq included) are indirectly under the shadow of Soviet Russia.

Taking the smaller question first; Transjordan's position *vis-à-vis* the Nejd has been considerably improved by the conclusion of the Hadda Agreement of 1925, definitely defining the boundaries between Transjordan and the Nejd and settling certain frontier questions in the interests of peace, and this has just lately received additional strength from the new Treaty of Jeddah signed by Sir Gilbert Clayton on behalf of the British Government. Yet it is doubtful whether such agreements can be regarded as sufficient safeguards against aggression. Provision must, therefore, be made against attack from this quarter and, judging from past experience in Transjordan, there is every reason to assume that the Air Force units can deal with most possible contingencies.

Turning to the larger and more complex question; it is most unlikely that Turkey will move without considerable impetus from Soviet Russia, and only then if there is a big prize in view. Yet there are two features in Russian policy which must keep Great Britain and France ever on the watch. One is Russia's desire to reach the Persian Gulf; the other her equally strong hope of extending her influence to the shores of the Mediterranean. Personally, I do not think that Russia will move, unless she can carry Turkey with her, and that would involve operations on the greatest scale.

Fortunately, the mandated territories are in a favourable strategic position to threaten the communications of a Turkish advance westward towards Iraq, and are on the flank of the line of advance from the Caucasus towards the Persian Gulf. Provided that the Beduins of the Syrian desert are "squared," reinforcements can be rapidly dispatched

to Mesopotamia by motor transport from Mediterranean ports. Haifa, Beyrouth and Alexandretta are the only ports of any military utility, and the latter, in French territory, is one of the strongest strategic points in the Near East. Haifa and Beyrouth are connected by railway with Damascus, the insignificant port of Tripoli is linked with Homs, while Alexandretta has a line to Aleppo; but as yet there is no connection between the Palestine railway at Haifa and the Syrian system at Beyrouth or Tripoli. It is hoped, however, that in the near future a connection will be established joining up the whole coast line by rail, since this project, as such, has already reached an advanced stage.

It must, I think, be assumed that in operations of the first magnitude Great Britain and France would act together, but their position would be greatly strengthened if Great Britain were to attract Kemalist Turkey to her side. One factor at least is clear, namely, that at the present moment external dangers are not great, but the greatest of them is Russia. Whatever action the native inhabitants were to take in the event of any outbreak of actual hostilities, they would most certainly be on the winning side at the termination thereof.

THE SOVIET UNION AND ITS WAR SCARE

THE war scare, with Great Britain as the bogey, still continues, and there are various reasons to account for it.

The rupture of relations and the unceremonious expulsion of the U.S.S.R. representatives last spring, coming as they did after several years of assiduous lying to the Russian people about Bolshevik power and influence in foreign countries, and coupled with the comparative failure in China, resulted in a marked reaction against the Bolshevik party throughout Russia. To counter the British action it was essential to persuade the masses of the people that the break was directed against the Russian nation and not merely against the Soviet Government. Hence the artificial war scare, which has at the same time served to distract attention from the Far East.

Presumably the scare, in its present modified form that "war is certain before long but will not begin this year," will continue until the effects of the British rupture have been discounted. It may, however, be taken as quite certain that the Bolshevik Government do not want war; they know well that they are not in a position to engage in war, and fully realise that an unsuccessful one would be fatal to them. Nevertheless, with their peculiar mentality, they are no doubt quite ready to believe that their enemies are only too anxious to make war on them before they have time to strengthen their position.

There is little doubt that the Soviet authorities are making the best use of a favourable opportunity to improve the efficiency of all three Services and are employing retired German officers in considerable numbers with this object in view.

Foreign Relations.

The foreign relations of the U.S.S.R. show little change. There are, however, indications that the focus of Bolshevik intrigue in the East is being moved from China to the borders of Thibet, Afghanistan and Persia, no doubt with India as the ultimate objective.

After much negotiation, a commercial agreement has at last been concluded with Latvia, whose government at the moment is known to be more favourably inclined towards Moscow than that of any other of the border states. The interest of this agreement consists chiefly in the disfavour with which it is viewed by the other Baltic States, particularly Estonia, where the present Latvian Government is greatly distrusted.

Economic Situation.

As regards the economic situation, the harvest is expected to be below the average and the internal situation is not believed to show much improvement, although certain industries, e.g., electrical and building, are reputed to be flourishing. Great Britain is naturally being blamed for this, the argument being that money which might have been devoted to agricultural or industrial purposes has now to be diverted to unproductive preparation for the threatened war.

THE STRATEGIC POSITION OF THE UNITED STATES

Being extracts from an article of that title by Colonel C. E. Kilbourne, Coast Artillery Corps, which appeared in "The Coast Artillery Journal" of the U.S. Artillery for May, 1927.

THE land frontiers of the United States border on Canada and Mexico. Both countries contain ample resources as to shelter and food for a modern army ; neither has the capacity for munitioning a balanced force, nor is there reason to anticipate an industrial development in either that would tend to result in such capacity. The bulk of the munitions would have to come from overseas—to Canada over favourable lines of communication from the east and over rather unfavourable lines of communication from the west ; to Mexico over lines of communication, a considerable portion of which are dominated by existing or potential United States bases."

" The Canadian border from Lake Michigan to Maine abuts upon an area vital to the United States. West of Lake Michigan there are sectors of varying importance, though none could be classed as vital; it should be noted that the development of communication is far superior south of the border. An invasion from any portion of Mexico would have to penetrate deeply before affecting materially the war-making power of the United States and only along the west coast and in Texas could any especially important utility be affected. Excepting the Great Lakes and the Rocky Mountains, there are no natural obstacles to invasion along our northern frontier; the desert lands of Northern Mexico and of our own Southwest are serious obstacles along the greater part of our southern land frontier."

" As to sea routes, it is to be noted that the Atlantic coastline of the United States lies practically in prolongation of the routes from northern European, as well as from Canadian ports. The strategic effect of this is to place every base or potential base on our Atlantic seaboard on the flank of the line of communications from northern Europe to every port more retired."

" The farther to the southwest an enemy makes his objective, the longer and more exposed will be his lines of communication and the greater the number of bases he must capture or neutralize. In fact, it appears that a step by step reduction of the defended harbours would be the only method of procedure promising entire security of communication to an enemy based on northern European ports."

" As for possible bases of operations near at hand, the coast of Canada offers several harbours suitable in natural features, only one of which, however, is developed. Operations from these bases would be affected by the trend of our coastline in the manner indicated in the foregoing paragraph. The Bermudas lie directly off our coast on a line perpendicular to the centre of our most vital area. While these islands are suitable for an advanced base for a minor operation, a considerable amount of dredging would be necessary before capital ships and large transports could enter. Furthermore, supplies of all kinds would have to be accumulated. A major operation, such as those mentioned later, could not be based thereon without extensive improvements. The Bahamas are less advantageously placed than are the Bermudas, and the lesser Antilles can be disregarded as a threat to our Atlantic coast, assuming that we hold the Virgin Islands and Porto Rico and that the Republics of Haiti, Santo Domingo, and Cuba are our allies or are neutral. Only by inconceivable stupidity in our own conduct of diplomacy, and a complete forgetfulness of their own future best interests, would any of the three countries named be found in coalition against us."

" The friendship of Cuba has resulted in making the Gulf of Mexico an American sea. Formerly the Yucatan Channel was open to the ships of an enemy, while our own shipping had to pass through the Florida Straits along the shores of a possibly hostile country. Now the Straits

are entirely dominated by us and, with the active alliance to be expected normally of Cuba, the Yucatan Channel is only less so. The Gulf of Mexico is to the United States what the Gulf of St. Lawrence is to Canada."

"Summed up, our Atlantic and Gulf sea frontiers are admirably conditioned both as to location and as to resources."

"Turning to our western sea frontier, we find a not dissimilar situation to exist. Our west coast contains comparatively few first-class harbours—Puget Sound, the Columbia, San Francisco, Los Angeles, and San Diego. From south to north each is protected by those further north, though not to so marked a degree as obtains for our Atlantic seaboard; and on the flank of the lines of communication from Asia lie the Hawaiian Islands with good harbours and large resources, both natural and in storage, and the Aleutian Islands with good harbours but without resources. It would appear that these bases must be neutralised before a major operation against our west coast can be undertaken with reasonable safety for the line of communication."

"Both to the north and the south of our west coast are strong natural positions. There are several excellent harbours, two of them well developed on the Canadian Coast, and one on the Coast of Lower California, the last being undeveloped and backed by meagre resources. All are dominated by the position and the strength of our own bases and by the much greater resources supporting them."

"It remains to examine the areas where an invasion would cripple our war making power. Roughly speaking, a line from Norfolk to Chicago divides our industrial area from our agricultural area, though the absolute separation of the two would not leave the former so reduced as to foods as was Germany, nor the latter so unfortunately placed for manufactured articles as was Russia, during the last half of the World War. However, there is no minimising the fact that our development has made the different sections of our country interdependent to a marked degree, and that a deep penetration of certain portions of our industrial area would materially lessen our war making power."

"With these facts in mind, we may consider certain possible lines of invasion and their effects:—

"1. Chesapeake Bay—the Potomac to Cumberland—thence northwest to the Youghiogheny—along the Youghiogheny to Pittsburg—thence along the Allegheny to Ore City—thence across country to Erie. This line would be favourable for penetration in some areas, difficult in others. If occupied it would have the advantage of a major water obstacle for two-thirds its extent. It would separate the industrial and agricultural areas, not so completely as the line Norfolk-Chicago, but very decisively. Given control of Lake Erie and of the North Altantic, simultaneous effort by well-prepared, well-equipped armies from the north and southeast would find no insuperable natural obstacle. However, the forces

would have to very large; their assembly and maintenance would be difficult. The force assembled at Lake Erie must be transported and supplied over routes (few in number) paralleling our northern frontier. Unless protected by forces equal to those we could assemble during the concentration, we could thrust north and break the lines of communication. Similarly, the selection of Chesapeake Bay as a base would leave our forces based upon northern harbours on the immediate flank of the lines of communication."

"2. A more favourable line, in that the forces required would be smaller is the following: Chesapeake Bay—the Susquehanna and Erie Rivers to Elmira, New York—thence overland to Lake Cayuga and from the northern point of Lake Cayuga to Lake Ontario. The country is much more favourable, and the line, when occupied, much stronger in that all but about fifty miles has even more formidable water obstacles than the line first mentioned. It would still be effective in seriously crippling the balanced supply of our armies and population. Except that fewer men and hence fewer supplies and a shorter time for concentration would be required, the same difficulties confronting the first plan would be met."

"3. Delaware Bay—Delaware River—Lake Cayuga—Lake Ontario. This is a shorter route over still more favourable terrain. It passes through the heart of our munition area. The sea lines of communication are somewhat shortened and there is one less base threatening their flank. The difficulty of concentrating the northern force would be less than those of the two preceding cases only in that smaller numbers would be required."

"4. New York City—the Hudson—Lake Champlain. The difficulty of the northern concentration is materially lessened; it becomes a possibility not beyond reason. The southern expedition for the seizure of New York City would face a serious risk. Unless the bases to the north and south were neutralised, such an effort would suffer all the hazards of attack upon a re-entrant in an unshaken line. Such efforts have usually resulted disastrously in tactical operations; and in strategy also, unless pushed through to prompt and complete success, have generally failed. Furthermore, the occupation of this line, while it would ruin New England, would deprive the balance of the country of many important items such as the bulk of the leather, wool, and rubber products, and would disrupt the finances to a serious extent, would not reduce decisively the ultimate strength of our counter offensive."

"5. Through Boston and Massachusetts to the Hudson, combined with an attack from the north via Lake Champlain, with the ultimate objective of occupying the line discussed in paragraph 4. By raids to occupy the Kennebec, Portland and Portsmouth, and with a screen south of Cape Cod, the dangers of efforts previously discussed are minimised. The result, however, would not be decisive. Time would permit

of at least a partial adjustment of finance and the preparation of a counter offensive which might prevent the junction of the two forces."

" From the foregoing it is seen that operations capable of producing a prompt and decisive result are all precarious due to the strategic location of our bases and to the position of our northern frontier with respect to Canada's lines of communication. Also that, as the plan is curtailed to reduce the risk of complete failure, the effect of success also is reduced until, when an effort promising reasonable expectation of success is reached, the effect ceases to be decisive and could not result in our suing for peace."

" Attacks in other areas might prove embarrassing, but could lead to no decision unless coupled with a major operation such as one of those outlined above. The interruption of lake traffic at Sault Ste. Marie, the seizure of the Puget Sound area, the occupation of the oil fields of Southern California or Texas, or of the industrial areas of Georgia and Alabama, would all be damaging, as would a raid cutting the railroad lines between Philadelphia and New York. But the effect would be only temporary—an enemy incapable of making a greater effort would be wise to attempt none."

" Turning now to our overseas possessions : the Philippine Islands have resources to feed and shelter armed forces sufficient for their defence, but lack industrial development. Their distance from our manufacturing area renders the supply of munitions in quantity, after war is declared, difficult, if not impracticable. To store sufficient munitions, and to maintain them, in a tropical climate, would be an expense unjustifiable. We must accept the islands as a strategic liability. Their best defence would be an offensive move, by our main forces from the United States, against the vitals of the enemy. No decisive result would come of the campaign in the islands themselves ; their ultimate disposition would be decided by success or failure elsewhere."

" From any point of view Guam is less tenable than are the Philippines."

" The Hawaiian Islands lie nearer our coast than the coasts of any other power. The most important island, Oahu, is admirably fitted by natural strength for a fortress. The island could be made to sustain the force necessary for its defence. Munitions must be stored and replenished, and proximity to our coasts makes this possible. The isolation of the islands, their position as an outpost of our west coast, their fitness as a concentration point for further operations, and their size, all render them an objective for a surprise major operation at the outbreak of war. Few positions in the world dominate an area so decisively as the Hawaiian Islands do the North Pacific. They are vital both to ourselves and to any enemy operating in that ocean."

" The Aleutian Islands, save for fogs, irregular currents, storms and lack of resources, would be second only to the Hawaiian Islands in the

strategy of the North Pacific. Even with their drawbacks they cannot escape consideration."

" Alaska has a climate that is its best defence. It can play no major portion in any struggle, and is a strategic consideration only as a staging point in possible air operations."

" The Panama Canal is the most important of our overseas holdings."

" Taking first the Pacific, all routes from Asia are very long, beyond the cruising radius of any but the larger ships. We find also the absence of suitable bases *en route* excepting our own ports and a few ports in Canada. There are also a few potential bases in Mexican and Central American ports. But there are none on any direct route from Asia not held by the United States, the communication with which from Asia are not threatened by one or more of our bases. This means that for security these bases must be captured or neutralised or that a wide detour to the south must be made."

" The shortest detour offering any sheltered anchorages *en route* is more than 3,000 miles longer than the direct route. None of these anchorages pertain to islands having resources suitable for the service of a fleet ; they belong or are mandated to various nations, a factor limiting the accumulation of supplies for the conduct of war by any special nation. And, if we are prevented by economic reasons from storing munitions in the Philippines, how much less likely is any other nation to develop a base in the central Pacific for the sole purpose of making possible an expedition against the Panama Canal. For even at best the conditions would be difficult. The nearest group of islands, the Marquesas, is over 4,000 miles from the Canal. A fleet based thereon would have to meet a fleet with one base (the Canal itself) immediately at hand and with another base (San Francisco) at a distance approximately 1,000 miles less than the presumed enemy base. Allowing substantially the same force, and eliminating accidents, the outcome of such a naval campaign is obvious."

" The situation would be at once reversed should the enemy be based on the South American Coast. From a strategically well protected location, Panama would become a very exposed one. So far, no west coast South American nation has developed great naval power, nor has any concluded an alliance with any maritime nation."

" In the Atlantic the distances are much shorter. On the other hand, the United States actually holds or has practical alliance with the nations holding the great majority of anchorages suitable for development into a fleet base in the Caribbean area. Great Britain has two. We hold or control the balance. Only one (in the Canal Zone) has been developed. Should others be initiated the proximity of our shores and our resources would give us a great advantage in the race. And we would undoubtedly proceed to develop a defended fleet base in the Antilles should any other nation undertake to do so, since such action could have but one object—to dominate the Caribbean and hence the routes to the Canal."

" Reference was made to the Gulf of Mexico as being an American sea. The Caribbean Sea is only less so. To gain an idea of the strength of our strategic position one need only read history. Always an important area, the control of the Caribbean has been multiplied in value by the construction of the Panama Canal. And yet we see no nation moving towards that end. The Caribbean was an area of contest for centuries—practically all maritime nations have or had holdings there ; practically all fought for supremacy. But when the United States secured Porto Rico and was practically assured of the alliance of Cuba and the Dominican Republics, Europe's interest flagged. The trained statesmen and strategists realised the hopelessness of the contest. Even Great Britain, which had theretofore demanded an equal share in any canal that might be constructed and had treaties guaranteeing this, changed her policy completely."

" The chain of islands from Cuba to the Virgins gives us not only protected sea routes two-thirds of the way around the Caribbean, but also an excellent air route. These, with the proximity to our bases and supplies, gives to the United States an advantage that is preponderating. Interruption of our communications is almost impossible, and would have to be of considerable duration in order to be serious on account of the size and resources of the islands in the chain. The communications of the enemy would be constantly threatened from flank and rear."

" The conclusion seems obvious that, in the present state of development of South America, Panama's strategic position is defensively one of the strongest in the world."

" Before concluding the discussion of our strategic strength from the defensive standpoint something seems appropriate as to resources. That we are practically self-supporting has been mentioned. That we have within our continental borders approximately one-half of the world's supply of most of the raw materials essential to the manufacture of munitions is equally important, for it makes our alliance of great value and our enmity a serious threat to any nation engaged in war. We hold also one of the bottle necks on the routes of the world's commerce and have power to grant or deny its use at will. These factors, so deeply affecting the supply of other nations, are in themselves a great asset in defensive strategy since diplomacy strives to accomplish the objects which would otherwise have to be gained by war, and hence its strategy replaces frequently, and precedes invariably, the strategy of war."

NICARAGUA

The U.S. Navy Department has announced that complete order has been restored in Nicaragua, and that practically all weapons formerly used by both factions are now in possession of United States troops.

Occupation forces in Nicaragua have been reduced to 62 officers and 1,148 men, and these will be kept for duty in connection with the Presidential elections to be held in 1928.

To supervise the Presidential elections a commission is to be appointed, of which General Frank R. McCoy has already been nominated as Chairman by President Coolidge.

THE SOUTH AFRICAN FLAG

By NEIL GRANT, C.B.E.

THE settlement regarding South Africa's flag, which has at last been reached by the two principal South African parties, the Nationalists, headed by General Hertzog, and the South African party, headed by General Smuts, will cause intense relief throughout the British Empire, and also in all those European countries which become very nervous when England is distracted by some overseas problem from giving adequate attention to Continental diplomacy.

The compromise, which is of course a victory for common-sense, is logically and actually the outcome of the last Imperial Conference. To that historic meeting General Hertzog came prejudiced by the bias of his race, full of political and personal antipathy to General Smuts, and the reputation which that shrewd soldier-statesman had achieved in the councils of the Allies during the war and the peace negotiations, and practically committed by his political connections to take a distinctly anti-British line at its deliberations. It is not unfair to say that General Hertzog came over here an anti-Imperialist, but he was taken in hand, not in a cunning or super-clever way, but in a sensible, friendly British way. It is said that Lord Balfour and Lord Birkenhead were primarily responsible for his conversion.

The chances are, however, that General Hertzog needed no manipulation once he took his place at the Conference table in Downing Street, and found that so far as voting and consideration for views expressed were concerned he was on a footing of absolute equality with Mr. Baldwin himself. The many private conversations which he had with Mr. Mackenzie King, the Canadian Premier, secure in his comfortable majority, and therefore inclined to take a roseate view of Canada, the British Empire, and life in general, also did much to dispel the numerous misgivings with which the mind of the Union Prime Minister was loaded when he landed at Southampton

At any rate, General Hertzog left London with the famous Draft of the Conference on Imperial Relations in his pocket, which he was able to present to his sympathizers in South Africa as the great gift which he had brought back from England—a gift, so he hinted, much

finer than anything which General Smuts could have secured. It was hoped, therefore, both here and in South Africa, that General Hertzog would be content with the definition of equality within the British Commonwealth of Nations which had been proclaimed in London.

Unfortunately, however, he was not able to prevail against the narrow racialism of some of his colleagues, notably Dr. Malan, Minister of the Interior. It is said that if General Hertzog had called Dr. Malan's bluff, he would have been able to have scrapped the Flag Bill and the unfortunate controversies which have arisen from it. At any rate, he seems to have given way, with the unfortunate result that the more bigoted members of the Nationalist party began to take up, in regard to the Flag Bill, an attitude so uncompromising that if persisted in it would undoubtedly have led to serious rioting, if not civil war.

Many of the most frantic supporters of the Government's Flag Bill were men who had bitter memories of the old concentration camps, or who themselves, or their families, had taken an active part in the South African War. They loathed the Union Jack as the symbol of the conquering power, and they looked upon the devotion of the English-speaking race to the Flag of the Empire as a betrayal of their South African nationality, as reprehensible as their habit of calling England "home," as if, they said, any man could have two homes. These prejudices and passions were fully represented in the heraldic design which they hoped to be able to force on the four provinces of the Union.

Their flag, roughly, consisted of three colours, orange, white and blue, with a shield on which the Union Jack in a very diminished and truncated form appeared along with the old Orange Free State and Transvaal flags, and four stars representing the four provinces of the Union. Many of General Hertzog's followers did not, however, conceal their intention of gradually eliminating the shield, so that even this small reminder of the Imperial connection would in time vanish. The Union Jack was to be flown on official occasions at the same time. General Hertzog consented to a referendum on the whole question, but it was framed in such a way that it placed the patriotic South African who wished to maintain his connection with the Empire and at the same time remain loyal to his South African nationality in a very serious dilemma, for he had either to vote for the Government's design, with its truncated Union Jack, or to vote against any South African flag at all.

The whole situation, therefore, was most serious. Many of General Hertzog's colleagues boldly proclaimed that they would not permit any alteration to be made to the Flag as the result of discussions between the two parties. The present Government in South Africa is a Coalition one between the South African Nationalists and the Labour Party, almost entirely British in complexion. This Labour group, whose leader is Colonel Creswell, seems to have given its support to the Flag Bill on the ground that if this racial issue were eliminated, the possibility of

Labour holding the balance between the two rival groups, and obtaining a share in the spoils of power, would go for ever. If that was the reason which prompted them to support the Bill, it was rather a foolish one, because the more the controversy developed, the greater was the discredit into which the Labour leaders fell among their own supporters who, however opposed they may be to capital, still have a very strong affection for England and for the British Empire.

Among the British section of the community feeling ran particularly high especially in Natal, whose representation in the Union Parliament is, I believe, with one exception, entirely British. We thus had this situation in South Africa, that the old antagonisms of the war, which it was hoped the wise conciliatory policy of successive British governments had buried for ever, were rising again with a threat to plunge the Dominion into a fratricidal struggle—a grave enough contingency under any circumstances, but doubly so when one thinks of the serious problem of the colour bar which hangs over South Africa, and the solution of which will in the years to come demand from the white races all the wisdom and statesmanship of which they are capable.

At the darkest moment, however, there were gleams of hope. There was General Hertzog himself, with his memories of the Imperial Conference. There was a very reasonable section among the English-speaking peoples—witness, for example, the attitude taken by Sir Abe Bailey, and so patriotic a newspaper as the *Rand Daily Mail*. Above all, there was Mr. Tielmann Roos, Minister of Justice in the Hertzog Cabinet. It was he who was primarily responsible for the solution which has removed the clouds of racial strife from South Africa, and it is in that connection that the Imperial Conference comes in.

Mr. Tielmann Roos made a suggestion not long ago, that as the result of the declaration concerning Imperial Relations made at the Conference, the South African Nationalists might see their way, if not to drop, at any rate to modify, the famous Article 4 of their constitution, which can be interpreted as a demand for secession from the British Empire. From the moment that Mr. Tielmann Roos made that declaration, the whole situation was changed. General Hertzog and General Smuts were brought together. They reached a provisional agreement which was submitted to the caucuses of the two parties and won their modified approval. The compromise which they reached, and which will probably be accepted by the Dominion as a whole, substitutes for the Government flag the old design of orange, white and blue, without the offending shield. In its place there are the Union Jack and the two Republican flags in the centre of the white stripe, with the Union Jack horizontal, nearest the pole, the Orange Free State flag, vertical, and the Transvaal vierkleur, horizontal. These three flags occupy about one-third of the white stripe, whereas in the old design the Union Jack occupied less than one sixty-eighth of the whole flag.

Thus South Africa has been spared, perhaps, another civil war. Great credit is due to the reasonable attitude taken up by men like Mr. Tielmann Roos on the one side, and Sir Abe Bailey on the other, and to the sensible moderate tone adopted by the English press, but the Imperial statesmen who met in Downing Street last year must not be forgotten either. By giving to the British Empire a charter of equality of status they have dispelled more than one narrow prejudice, and made racial strife appear not only an offence, but an absurdity.

CHINA: THE YEAR IN RETROSPECT.

By An Englishman in China.

"It is the opinion of the writer that the present process of disintegration will increase rather than diminish."

A YEAR ago this pessimistic forecast appeared in an article from the pen of the present writer when writing about China in the Journal. At that time a map was attached showing predominant influences in China: to-day the process of disintegration has gone so far that it would be almost impossible to supply such a document. It is instructive, however, to note that in the span of twelve months the rulers who were shown on that map have in every instance lost the territory they were shown as controlling, except in those regions bordering on, and lying North of, the Yellow River. This points to two conclusions: firstly, that there is an element of greater stability about the Northern Chinese than is to be found amongst the Southerners, a fact which is generally recognized and might without any acquaintance with China be safely deduced from the effect of latitude on the psychology of European nations; secondly, that the results of the almost daily battles which are being fought in China are so ephemeral that those engagements, except in so far as they immediately affect the European communities, merit very little attention indeed.

The period under review falls naturally into two divisions; that of Russian initiative and interference terminating, with fitting ignominy, shortly after the fall of Shanghai; and that of a return to China run by the Chinese as it more or less has been run since the Revolution.

The Chinese have never displayed any love for foreign control, least of all Russian, and the unnatural alliance which sprang up between the Soviet and the Kuomintang was cemented by utilitarian motives, the result of a peculiar combination of circumstances rather than of mutual

affection. The Kuomintang had come to regard the foreign Legations, functioning in the capital of enemy country, as very definitely partisan. The transmission of all customs funds collected in South China to Peking, under pain of foreign intervention, was considered, however erroneously, not only as proof, but as an extremely onerous proof, of active Northern sympathies. When a foreigner denied to an ordinary peasant in South China the false report, sponsored by the Soviet, that Great Britain was supplying Wu Pei-fu with money and arms, the peasant replied: "I may be willing to believe you because I have known you for a long time, but not one man in a hundred in this district will do so." If there is one thing a nation detests, as the Soviet has now learnt to its cost, it is another nation interfering in its internal politics. For this reason one appears justified in believing that amongst the Kuomintang there developed a very definite antipathy for the Great Powers. This was further intensified by the repeated failures of that party's much-heralded annual Northern expeditions; for it was more comforting to assume that reverses were due to external interference rather than to internal incompetence. The result was that when the Soviet made overtures at Canton they were greeted with even less scant courtesy than had been the case in Mukden. Both the Soviet and the Kuomintang had one common tenet in their creeds, namely, that the Great Powers had in the past supported their enemies and merited revenge. But beyond this their fundamental principles were poles apart. The Chinese are individualistic to a fault, and they could hardly be expected to do more than the scantiest lip-service to Communism, except in so far as they found it personally remunerative.

In the unnatural alliance which sprang up each party intended to use the other as a tool for its own private ends. The Kuomintang looked to the Soviet to supply funds and munitions as the sinews for its Northern campaign. Russia looked to the Kuomintang as an instrument with which to hack away the foundations of the British Empire, to imperil our position first in China, then in the Malay Straits, Burma and India. Propaganda of a scurrilously anti-British type was intended to cement these two parties together which it was felt, owing to their disparate natures, could never alloy.

By definitely backing a party in China with money, munitions, military advisers and an army of propaganda experts the Soviet managed to seize the initiative and at once forced the Great Powers to adopt a purely defensive rôle. Russia had no trade or vested interests in the country which would have necessitated its acting with becoming caution; it was therefore free to attack without considering defence. The Great Powers might, of course, have imitated its methods and by supporting another faction in China attempted to seize the initiative themselves. There were many who advocated such a policy. Where, however, was it going to end? In another Great War (which the Chinese describe as our miserable little tribal dispute, about which they cannot imagine

why we make so much fuss) to be fought out in Asia ? When one considers the alarming frequency with which Chinese allies abandon each other, is it to be supposed that those whom the Great Powers might have secured would have shown any greater constancy for their foreign associates ?

Again, there were very strong moral reasons against military adventures of this sort in another country's civil wars ; these alone were sufficient definitely to rule out such a policy.

The first act of Great Britain was to eliminate all grounds of genuine grievance, on which propaganda could find support, by the issue of its now famous Christmas Memorandum. This created little immediate effect upon the Chinese, who regarded it rather as a sign of weakness than friendship, but it united public opinion at home and informed it throughout the world. The Customs Surtax had been definitely promised at the Washington Conference and the continued delay in bringing this promise into effect, although through no fault of Great Britain, placed a very powerful argument in the hands of her enemies, namely, that of bad faith. The Tariff Conference had sat for months and finally dispersed without finding a means by which this promise could be fulfilled. The Memorandum, however, offered a simple solution, namely, to give the surtax to whoever controls the port where it is collected. The results have been far reaching. The wrangling over its method of collection led to the dismissal of the Inspector-General of Customs, Sir Francis Aglen. This incident was given undue prominence in the Press largely on account of its dramatic setting.

Many expressed the opinion that loans secured on the Customs would be thereby imperilled ; as a matter of fact they stand higher to-day than before the incident—it merits no other name—occurred. The retention of the Customs' surtax by Southern ports would appear largely to have healed the old sore of other Customs funds being transmitted to Peking ; at any rate since surtax collections commenced, the question has not been raised in its former acrimonious form. The retention of these surtax funds, the magnitude and very existence of which is dependent upon foreign trade, by the Chinese in control of the different treaty ports may be considered to act as a handsome inducement to the local officials to protect and further such trade. To what extent this has been the case it is difficult accurately to determine, but it is the writer's opinion for what it may be worth, that it actually has exercised a stabilising effect in the Southern treaty ports.[1] It was feared by many that the grant of this surtax would be used as a thin edge of

[1] Since the introduction of these surtaxes Canton, where formerly political changes were amazingly frequent, has maintained the same conservative dictator. Swatow also, until quite recently, has been able to fend off the hostile rabble armies which are drifting about the rest of the province. It would seem therefore that this provision of funds assists the Treaty Port dictators to resist successfully the penniless forces which otherwise might have captured their objectives.

the wedge for forcing tariff autonomy, leading to taxation so heavy as to throttle trade. These fears have, however, to the present proved groundless ; the attempt of the Nanking Government to adopt such tactics failed, partly owing to the general unpopularity of the imposition of new taxes, but more especially because Customs collections are made mainly at a few centres which the Powers can control.

It was a natural corollary of Great Britain's strictly defensive role to despatch an expeditionary force of such magnitude as to make it extremely unlikely that it would become actively involved in any conflict ; its strength was such as to prevent any Chinese faction challenging its authority. The bill which had to be met was certainly heavy, but regarded as insurance rates on the property to be protected it was not excessive. At a conservative estimate British capital sunk in China is £130,000,000. The sending of the Guards was a stroke little short of genius when one bears in mind the comparatively recent references of Feng Yu-hsiang and others to Britain's contemptible little army which need not be treated seriously. A most impressive optical demonstration was afforded that in war quality pulls more weight than mere quantity. The transparently sincere and conciliatory note struck in the British Memorandum, enabled this force to arrive in China with a minimum of criticism in the House of Commons.

Russia, having seized the initiative, it is not surprising that her progress was at first spectacular. Communistic cells were, at a lavish cost, injected into every portion of the anatomy of South China. It seemed almost certain that the disease would be fatal. It now appears, however, looking back, that the process proved little more than an intensive form of inoculation against the disease itself. Almost every day we read in the Chinese Press of Communists in every part of China being taken out and shot ; furthermore, every political platform now has the eradication of Communism as its major plank. Whether this reaction is merely temporary or permanent must remain for some time a moot point.

It was obvious that as the Kuomintang advanced northwards Soviet influence would tend to wane. There were two very good reasons for this. Firstly, that Mongolian and Manchurian affairs would enter the region of Kuomintang practical politics and give rise to ugly reflections. How was it that this Anti-Imperialist Power had grabbed more Chinese territory than all the other Powers put together ? How was it that it was still in control of several hundred miles of Chinese railway ? Could propaganda, even the most skilful, supply a pleasant appearance to these ugly facts ? The second reason was even more disturbing. Would not the tool, which so sorely chafed the hand which grasped it, be ruthlessly flung away as soon as, perhaps even before, it had completed its task ? To avert these dangers propaganda was worked at feverish speed, but to perform its task it needed more sustenance. The Powers, however, were determined to restrict it to a starvation diet,

quite as determined, as was the Soviet to create new incidents on which it could feed. The seizure of the British Concession at Hankow failed to supply the incident so desperately required. Great Britain preferred to accept a heavy tactical loss rather than risk a strategical defeat. Chiang Kai-shek was already on the verge of open revolt against his Soviet ally, whom he accused of having attempted his own murder, while the Nanking atrocities, it is generally supposed, were the last desperate fling of that ally to maintain control, and retain the initiative in China. These would surely create the much needed incident through a punitive expedition.

Then, as suddenly as events do occur in the Middle Kingdom, the late allies of the Kuomintang, almost overnight, awoke to find themselves proscribed as enemies—the tool had been flung away. The best description of their achievements is perhaps supplied by the Russians themselves. A telegram from Riga dated 14th July, states: "The Ikki or Executive Committee of the Communist International has issued a long statement carefully considering the China situation which comes to the conclusion that the year's Communist efforts have met with total defeat, and that it is necessary to begin all over again."

We now pass on to the second period. "The Slav imagination," wrote Maurice Paléologue, who had spent so many years in Petrograd, "far from being constructive like that of the Latin or Anglo-Saxon, is essentially anarchical and dispersive." The summing-up of the Ikki in their Memorandum published on 14th July was perhaps too modest. In accordance with the lights of their imagination, the peculiar imagination which Paléologue describes, the Russian adventurers had achieved a good deal. They had, during their short direction, reduced the whole of the Yangtze valley to chaos. The Taiping Rebellion, in which more perished than in the Great War, scarcely produced more desolation. Today in the great city of Hankow, with its population of over one million, there is not a Chinese merchant worth five thousand pounds. Wholesale political executions have become so common, in a country which sixteen years ago boasted (though somewhat inaccurately) of its bloodless revolution, as scarcely to merit record in the Press. The adventurers, according to their lights, have certainly achieved something! We must not, however, fall into the popular error of giving them credit for everything that has occurred. China has been rapidly disintegrating and the process unaccelerated by the Soviet stimulus would probably have produced of its own momentum a situation in the Yangtze Valley most unfavourable to trade. That trade is dead in Hankow is due to the chaotic conditions of Central China. Had the ex-British Concession remained in competent foreign hands it is difficult to see how this would have materially affected the situation. The pertinent question may well be asked whether French trade or Japanese trade at Hankow is not equally dead despite the fact that there still remains a French and a Japanese Concession. It is difficult to see what a so-called "strong"

policy, as opposed to one tempered by conciliation, could be expected to achieve.[1] Could it bring order out of chaos, or enable the Chinese merchant to move goods freely without fear of seizure or interference from the innumerable brigands, pirates, independent military chieftains and self-termed officials who swarm on China's highways and waterways? And if goods cannot move how can trade proceed? The surrender of the Hankow Concession had, amongst other consequences, the unfortunate effect of causing the Shanghai Municipal Council a certain embarrassment in raising sufficient revenue for its maintenance, but it should be borne in mind that its maintenance is on a somewhat munificent scale; its numerous Commissioners, despite shorter length of service, receive salaries twice as large as His Majesty's Consuls-General in China. Perhaps a little retrenchment might have minimised that embarrassment. If a tree should be judged by its fruit alone, our commerce in China throughout the year, is certainly a disappointing product of the sustained efforts which have been made by Great Britain to assist British interests in China. The soil in which the tree has taken root must, however, also be considered. It is difficult to conceive of anything more barren, so far as trade is concerned, than that offered by China to-day. The Soviet tree, despite the golden raindrops showered on it from Moscow, has shrivelled up and died. The hardy Japanese shrub, which has in recent years made such astonishing growth in the Malay, has throughout the year been rapidly losing its roothold in China, notwithstanding the most solicituous attentions from Tokio. No one can accuse America of having adopted a "strong" policy, yet her trade has suffered least of all. The truth of the matter is that the times are out of joint, and no policy by the Powers, however able, could restore prosperity.

It is sometimes suggested that the clash of interests in Manchuria will lead to a second Russo-Japanese War. When Chang Tso-lin raided the Peking Russian Embassy it was also suggested that that act might involve him in a war with the Soviet. Those acquainted with the Russian public were, however, sceptical. "They will not support another war in Manchuria" it was declared, "and no one realizes this fact better than their own Government."

There is perhaps one incident which occurred during the year which is of sufficient controversial interest to merit mention before we close; it is Lord Inchcape's speech, in which he accused the missionaries of having aided in the destruction of the old, and the introduction of the new order—or rather disorder of things. With the conviction of ignorance many English bishops saw fit unequivocally to denounce this statement as entirely false. A distinguished missionary educator, Dr. Francis Hawks Pott, who should be better informed than his fireside colleagues, when reviewing the same subject in 1900, before the

[1] In this connection it is interesting to note that after the Treaty of Nanking, the outcome of a strong policy, British trade was carried on for ten years in China at a twenty per cent. loss.

consequences were as ominous as to-day, wrote " the last charge against missionaries calls for only a few words. They are said to disseminate teachings that inevitably lead to rebellion. To this indictment the missionary would probably willingly plead guilty. It may truly be said that the missionary has been the founder of the reform party in China. What then ? Must he desist from his efforts in order that the old *laissez-faire* policy of those interested in keeping China as she is may succeed ? We think not. The policy that trembles at the thought of any possible disturbance of trade is extremely short-sighted. For the present gain it would relinquish vast future possibilities."

Writing sixty years previously in his book on China, the famous pioneer missionary, Medhurst, expressed similar sentiments in embryo : " Three hundred and sixty millions of human beings huddled together in one country under the sway of *one despotic monarch* . . . how unaccountable it seems that one individual should be allowed to fetter the minds of so vast a portion of immortal men . . . how distressing to think that this nation has been for ages in its present demoralised and degraded condition . . . amongst them there is none righteous, no, not one . . . there is none that doeth good, no, not one . . . how truly affecting and heartrending is it, that so large a portion of the human race should be shut up together under *one tyrannical Government.*" To-day the one despotic monarch has been ignominiously kicked out ; so also has the one tyrannical Government, and so also, most of the missionaries !

GENERAL PRIMO DE RIVERA

General Primo de Rivera, Marques de Estella, was born at Cadiz on 8th January, 1870. His military career began at the age of 14.

After four years in the Academy he was promoted second-lieutenant of infantry in 1888, and became full lieutenant in 1890. Three years later, in October, 1893, his regiment, that of Extremadura, was ordered to Melilla, and he went with it as standard-bearer. He soon had an opportunity of distinguishing himself, for on the 27th of the same month his unit was in action and fighting continued till 2nd November. Primo de Rivera displayed such bravery that he was promoted during the battle of Cabrerizas on 28th October to captain, and was decorated with the first class Cross of San Fernando. Garcia Perez, in describing the act of bravery in his book " Flores del Heroismo," says : " The artillery officer who commanded the two guns in front of the fort fell wounded and was carried into the fort at the same time as one of the guns, the other remaining outside. The enemy attacked furiously in great numerical strength. The commandant of the fort gave orders that the other gun should be brought in so that it should not fall into the enemy's

hands. Primo de Rivera offered himself as volunteer for the task, and sallied with five soldiers under severe fire, secured the gun and brought it back to the fort with great bravery, losing two of his companions killed and one wounded."

In 1895, when Martinez Campos was nominated Commander-in-Chief of the Spanish Army in Cuba he took Primo de Rivera with him as adjutant. They had just landed when the order was given to Primo de Rivera to join in the operation for the relief of the garrison of Santiago de Cuba in which he distinguished himself greatly. He later took part in various battles and on one occasion commanded a convoy by water to Canto under circumstances of great difficulty. For his conduct he was mentioned several times in despatches by the General-in-Command at the battle of Peralego. In December of the same year he was promoted to major as a reward for his bravery at Santa Maria de la Sabina where he commanded the advanced guard.

Soon afterwards he returned to Madrid as adjutant to the Captain-General, but remained only a brief period as he pleaded to be sent back to Cuba. There he was under orders of General Segura until May, 1897, when he was appointed adjutant to the Governor-General of the Philippines. He was there given command of the 3rd Rifle Battalion, and with it participated in the battle of Balincupang, and the two fights at Puray. For the gallantry he displayed in the first of the combats he was promoted lieutenant-colonel in July, 1897. He was then chosen to undertake a daring mission which also called for diplomacy, namely, to negotiate peace and collect the insurgents' arms. For forty days he was entirely alone among the hills and in the insurgents' camp. At the conclusion of the mission he was selected to accompany the Philippine chieftains to Hong Kong, and he was granted for this service the Cross of Maria Cristina and proposed for promotion to colonel.

In 1898 he returned to Spain again and was nominated to the command of the Alba battalion, at the head of which he was engaged in the suppression of the disorders in Barcelona in February, 1902.

When the General Staff was first formed in Spain he was nominated Staff Officer, but he remained with it only a short time, as he was given command of the Talavera Rifle Regiment, which he retained till November, 1908, when he was promoted colonel by seniority.

Primo de Rivera then went to Paris on a military mission, where he stayed till the Moroccan campaign of 1909 began, when he volunteered for service in Africa. Proceeding to Melilla, he took part in numerous fights. He was appointed commander of the Melilla Regiment, and placed in charge of one of the columns which attacked the hilly region of Gurugu, where he remained to organize the defence of the positions taken.

In June, 1910, Primo de Rivera was again sent to serve on the General Staff in Spain, where he remained till September, 1911, in which month he returned to Morocco at the head of the San Fernando Regiment. He was wounded at the forced passage of the River Kert, after which he was promoted Brigadier-General, and placed in command of the Rifle Brigade in garrison in Madrid. With this brigade he embarked for Ceuta in May, 1913, marching from there to Tetuan and its advanced posts. He, with his men, took the position of Laucien, whence he carried out reconnaissances along the roads of the Fondak and to Ben Karrich, and also joined in battles along the Tangier and Wad Ras roads, in the territory of the Beni-Hozmar tribes, in the ravines at Beni-Ider and at other places. For his brilliant leadership he was awarded the Grand Cross of Military Merit with a pension, and in December of the same year was promoted General of Division for his war services.

From that time on, his military service was of a peaceful nature. In October, 1915, he was appointed Military Governor of Cadiz, and held the post till March, 1917, but during that time he went with a Spanish military mission on two occasions to visit the French and British fronts in France.

In July, 1911, he was given command of the First Division of the Army. In July, 1919, he was promoted Lieutenant-General, and in July, 1920, appointed Captain-General of the Valencia region, whence he was transferred to Madrid in a similar capacity.

A few months after this appointment he was relieved from office in consequence of a speech he made in the Senate in opposition to the views of the Government on the subject of Morocco.

In March, 1922, when the Captain-General of Catalonia, General Olaguer Feliu, was made Minister of War, General Primo de Rivera was chosen to replace him, and remained in office until the notable political movement of September, 1923, when he took the lead in turning the civil government out of office and became head of the Military Directory.

This Directory was replaced by a semi-military, semi-civilian Cabinet on 3rd December, 1925, with the General as Prime Minister.

For a further appreciation of Primo de Rivera's services to Spain, in his position as head of the Military Directory, reference should be made to the article entitled " Spanish Military Affairs," which appeared in the JOURNAL for November, 1926.

CORRESPONDENCE

[Correspondence is invited on subjects which have been dealt with in the JOURNAL, *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—ED.]

THE BATTLE OF LE CATEAU.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Some months ago Marshal Foch honoured us by unveiling at Chapeau Rouge a memorial to the 1st Division. Some of our newspapers reported him as saying that this formation, at the battle of Le Cateau (26th August, 1914), covered the retirement of the IInd Corps from Mons. It seems improbable that he was correctly reported, since such a statement is wrong historically. Anyhow, it is deplorable that English papers should give so false an impression concerning this battle, in which no portion of the Ist Corps (1st and 2nd Divisions) took part. The 2nd Division indeed might have played a highly important part at Le Cateau, if the Ist Corps had carried out the orders of G.H.Q. to retire south-west. Had it done so, the route of part of the 2nd Division must have taken them within two miles of Le Cateau, and they might have made the battle a tactical, as well as a strategical, victory. Presumably, owing to the threat from the west, indicated by the affairs at Marvilles and Landrecies on the 25th, the Ist Corps was thought to be in grave danger of being caught between the First and Second German Armies. Nothing else apparently accounts for the fact that instead of retiring south-west, as ordered, thus converging on the IInd Corps, the Ist Corps actually went south in a divergent direction. Though natural in the circumstances, this was unfortunate; since the fighting at Marvilles and Landrecies was the result of chance encounters between units of our 2nd Division and units of the German First Army which had spread themselves westward through the Forêt de Mormal; and which, early on the 26th, turned their backs on the 2nd Division and marched against the IInd Corps.

Chapeau Rouge, a little north of Etreux, is a fitting site for the memorial to the 1st Division, because in its neighbourhood the rear party of the 1st Division's rear guard put up a heroic fight, delaying for six hours a force several times its strength. It was the first stirring incident of the 1st Division's renowned career. It happened, however, the day after Le Cateau and had no connection whatever with that battle. Moreover, though a magnificent example of rear-guard tactics on the part both of the commander, Major Charrier, Royal Munster Fusiliers—who was killed—and of the troops he led, it was but an incident and in no way comparable with Le Cateau, which we might venture to call one of the world's decisive battles. For what would have happened had General Smith-Dorrien decided not to fight? When, at 2 a.m. on the 26th, he received General Allenby's report, the exhausted condition of his men with the enemy on their heels—and,

above all, the fact that many of our troops were still a long way from their bivouacs—forbade any thought of immediate retirement. Had he retired at dawn leaving strong rear guards (for the cavalry, with their-worn out horses, were too scattered to cover him), the bulk of those rear guards would have been mopped up, and their casualties, together with those of the main body, would have been as great as the actual casualties of the whole force. Moreover, they would have lacked the fire-power to stop the Germans, whose cavalry would have discovered our true line of retreat; the IInd Corps would have had to fight, probably with their backs to the Oise; the Allied left flank would have been turned; Paris would have been either taken or isolated; and Germany would have gone near to winning the war in the west forthwith.

It is, therefore, lamentable that English newspapers, even if misled through the possibly incorrect report of Marshal Foch's speech, should give a totally wrong impression of Le Cateau; nor is it just to Sir Horace Smith-Dorrien. That great general's vision was wide enough to see that in order to make the best of a bad business a heavy responsibility must be faced; and his heart was stout enough to bear that responsibility.

Yours faithfully,

C. DE SAUSMAREZ,
Br.-General.

[General von Kuhl, Kluck's Chief of Staff, summed up the incident named in the latter portion of Brigadier-General De Sausmarez's letter—as it appeared to the Germans, that is to say—in these words: "But where was the British High Command on that day? One Army Corps marches off, the other remains behind contrary to orders and engages in an unequal contest."—(*Die Marneschlacht*, pp. 81-82. (Ed. 1921). See also "British Official History," Vol. I, p. 192. (1st Ed.) —EDITOR.]

FIGHTING CAPABILITIES OF THE ARMED MERCHANT CRUISER.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In view of some of the American arguments at the recent Naval Conference, the question of the fighting capabilities of armed merchant cruisers must be a matter of considerable interest.

A classical test of such capabilities was the duel between the "Carmania" and "Cap Trafalgar" on 14th September, 1914.

Of all the lessons that might be learnt from this action, the one which made the most impression on those engaged in it was the fact that the unarmed merchant ship will never have a chance of fighting a successful action against a man-of-war, even of the smallest type. The former cannot be placed in the same category as the latter in any way, much less can she be classed as a "cruiser."

If the armed merchant ship meets a rival of the same type, the result must depend, in the main, on their personnel and gunnery efficiency. Should these also be of nearly equal quality, both ships may easily be sunk through comparatively minor injuries.

In this connection, I would like to draw your attention to a serious mistake in the account of this action, given on pages 307-8 of the Official History of the War —Naval Operations—Vol. I. This gives the armament of the "Cap Trafalgar"

as two 4.1 inch guns, whereas she had eight of these weapons. The late Admiral Grant, who was Captain of the "Carmania," before sending his despatch from Pernambuco, asked me how many pom-poms the "Cap Trafalgar" carried, to which I replied that it was quite impossible to say, but that as we knew she fired at us from eight 4.1's I suggested saying her armament was eight 4.1's *and* pom-poms—thus leaving the number of the latter indefinite. This was the form in which the report was sent, but as the only official information at home was to the effect that the German ship had two 4.1's from the gunboat "Eber," it apparently was decided that the despatch sent meant that her armament was two 4.1's and six pom-poms.

This seems to me to be yet another case of official accounts being written without any of the surviving participants being consulted; the effect, in this instance, being to give this unique action the character of a massacre instead of that of a duel on more or less level terms, the issue of which was in the balance for over an hour.

Yours, etc.,

EDMUND L. B. LOCKYER,
Captain, R.N. (Retired).

SOME THOUGHTS ON TANKS.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—At the present time, when prophets are particularly numerous and busy, they would apparently have us believe that we have done with trench warfare for ever and that the land battle of the future between two tank armies will be something not very different from a fleet action of yesterday.

Personally, I was inclined at first to accept these prophets without much question, but as an officer whose military "stock-in-trade" is the stand-up fight, I consoled myself with the thought that at any rate the present state of affairs might last out my time. On further reflection, however, I began to doubt and to question, and in the end, even at the risk of also being dubbed a "prophet," I am now inclining to the view that there may be a niche for me in the military machine after all.

Looking back on history there is no obvious indication that the rate of movement of operations as a whole bears any direct relation to that of the constituents of armies. It seems that as regards movement, the general nature of the operations is conditioned by other factors and it is suggested that these factors are:—

(1) The strength of the defensive against frontal attack;
(2) The existence of invulnerable flanks.

To be more precise, the direct causes of the stationary character of operations during the Great War on the Western front were the ability of infantry, protected by trenches and wire, to resist frontal attack, and the ability of the combatant nations to fill the whole interval between impregnable flanks with infantry thus protected.

In the face of such defences, the mobile forces, cavalry, light artillery and infantry, all found themselves compelled to await the arrival and deployment of less mobile auxiliaries, particularly heavy artillery, which are not only slow in themselves, but whose action requires lengthy preparation. A point to remember

in considering future developments is that, although the original function of these auxiliaries was to destroy or clear away obstacles and defences, the weight of metal it was eventually necessary to bring into action was not directly dependent on the character of the defences; many of the largest pieces being engaged almost entirely in attacking one another.

We saw, indeed, that as soon as a halt was imposed to clear away obstacles preparatory to attack, each side commenced to pile up armaments of various kinds, which, as long as the halt persisted, grew steadily more and more powerful and less and less mobile. It seems reasonable to suppose that if the same necessity to halt can be imposed on the tank attack the same sequence of events will recur, and we may infer that the general character of tank operations will largely depend on the extent to which tank-proof obstacles can be constructed in those regions which are by nature suited to tank action.

One can only conjecture the form these obstacles will take, yet on the whole it seems to be fairly safe to assume that the anti-tank mine will be the chief of them. Whatever the size and power of the tank one may feel assured that quite a small mine exploded right under it will put it out of action even more effectually than a mine at sea will disable a battleship.

The defensive position of the future must then be protected as heretofore by trenches and wire—for infantry is not yet extinct—and by carefully sited and extensive minefields constantly repaired and renewed. Can we assume that time allow the preparation of such a position after the forces on each side have got on the move? The effort involved is so great that one may well be doubtful. In France in 1914 the front was stabilized in the first instance by trenches alone (wire came later to strengthen the defensive still further), peace-time preparation involved no more than the provision of picks and shovels.

The circumstances of the future are not parallel. Trenches and improvised defences alone will not stop tanks, while their rate of advance when free of obstacles far exceeds that of the foot soldier. The time available for fortification is thus reduced in proportion as its difficulty is increased. There seems no escape from the conclusion that tank-proofness will depend on peace-time preparation and that the development of the tank will engender a renewal of " permanent " fortification in some form or other.

This permanent fortification, though called forth by the tank, must equally be designed to resist attack by other mobile forces and will probably consist of a fortified zone organized in depth containing tank traps, mine fields, wire entanglements, gas proof pillboxes, and dugouts, with protected communications and signalling arrangements. If such an elaboration cannot be extended in peace time along whole frontiers where these are not protected by natural obstacles, it can and will be employed to protect vital centres from sudden attacks by fast moving and armoured forces.

It seems, in short, as if we were in for a return to the " ring-fortress " and the " fortified zone " designed to delay or canalize an inroad by mobile forces, until opportunities can be created for adequate counter-strokes. The situation is in fact an almost exact repetition of that at the beginning of the war in 1914. Whether subsequent events in a future war will follow a parallel course will depend on whether the resources of the defensive are equal to the task of bringing the attack to a standstill for long enough to improvise tank-proof defences along the whole front.

At the outset the " defensive " will naturally be that combatant whose mobilization is slowest or who is weakest in tanks. If the scheme of " permanent " defence of the country as a whole is planned on an adequate scale making the fullest use of natural tank obstacles and including a well-thought-out system of " trapping " tanks which have raided too rashly and too far, it is not at all improbable that the attacker will find it prudent to slow down very materially the rate of movement of his faster moving forces, until it may be that the rate of movement of the army as a whole is conditioned, as heretofore, by that of its slowest moving components.

If this conjecture be correct it would seem that the time available for improvising tank-proof obstacles may not be so limited after all and that where combatants are of nearly equal strength and sufficiently numerous to expose no flanks, stationary warfare is almost as likely and may be just as prolonged in the future as in the past.

Yours, etc.,

SAPPER.

THE ARMED FORCES OF THE BALTIC STATES.

THE FINNISH ARMY.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Having read the article " The Armed Forces of the Baltic States," in the May number of your esteemed JOURNAL, I shall be grateful if I may be permitted to correct certain inaccurate statements in the article, which give an altogether misleading impression of the state, moral and discipline of the Finnish Army.

In the first place, the statement that " owing to the existence of a considerable Communistic tendency in Finland the military value of the Army is rendered very difficult to estimate," is, to say the least, exaggerated. Precautionary measures were taken immediately after the War of Independence on account of the close proximity of Russia, but it is to be observed that these measures are not in any way connected with the present internal political situation. Communistic propaganda and the Communistic menace are at the moment of no more account in Finland and in the Finnish Army than in Western Europe.

Again, the statement " that the Finnish elements among the officers have for a long time past striven to eliminate the Swedish elements from higher posts on the grounds that the latter held far too large a proportion of these appointments " does not correspond with the actual facts, and gives at the same time a quite distorted view of the relations between officers in the Finnish Army.

In regard to the dissensions alleged to exist between the " Jäger " officers and the officers who had previously served in Russia, the question is of such a nature that its discussion within the narrow limits of a letter cannot be sufficiently full to prevent the possibility of misunderstanding. As was the case with the armies of many other countries after the World War, the corps of officers in the Finnish Army was not homogeneous in its composition. As Finland had not a national Army during the sixteen years that preceded the war, the theoretical and practical training both of the officers who took part in the War of Independence and of the new officers was naturally a labour of many years. As, however, military

education gradually progressed and bore fruit, the services of the less suitable and efficient officers were dispensed with quite irrespective of the question to which group the officers concerned belonged. Naturally, the retirement of the senior officers attracted considerable notice, while that of the junior officers passed unobserved. The same kind of thing has taken place in the armies of many other countries, but the explanation given of the facts in respect to Finland in the article does not correspond with the real circumstances which were the result of a useful and necessary development.

I also feel compelled to point out another error in the article. Apart from a very small number of officers who voluntarily served in Russia, Finns never entered the Russian military service.

The figures that are given in the article in respect both to the Finnish Army and the Civil Guards are in every instance inaccurate.

Yours, etc.,

"A FINNISH OFFICER."

THE GERMAN WAR FILM.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Quite lately I witnessed an exhibition of the recent German War Film and it immediately became obvious to me that this film is pure propaganda intended to cloak the German failures in the Great War. This is not by any means new.

As soon as the war was terminated by Germany's virtual surrender in the field, the manufacture of legends began to account for the national defeat. The "stab in the back" given to the Army by the collapse of the home front, and the outbreak of the revolution, was the first legend, easily conceived by the simple process of putting the cart before the horse.

Then the course of the war itself was examined, and it was broadcasted to the world that had not the programme of a dead Chief of the Staff, Count Schlieffen, been "watered down" by his successor, Count Moltke, victory would have been achieved in the first few weeks "according to plan." Schlieffen's famous plan, put on paper in 1905, has never been made public, only extracts and summaries of it having been divulged by military writers. From these indiscretions, it has been learnt that Schlieffen meant to send the German Armies through Holland as well as Belgium. He did not expect any resistance from Belgium, whose King, then Leopold II, he thought, would do no more than formally protest. He took no account of Russia—quite reasonably in 1905 at the close of the Russo-Japanese War—nor of Great Britain, neither of her fleet nor of her expeditionary force. In fact, the plan might have suited the circumstances of 1905, but was out of date in 1914, when there was no course except to alter it.

The next legend is embodied in the German Official Account of the First Battle of the Marne. It is that the Germans were on the point of gaining a great victory, when, owing to an unfortunate misunderstanding and an emissary of the Supreme Command, Lieut.-Colonel Hentsch, exceeding his powers, both the Second Army and the First Army retired. The real cause of Germany's defeat, however, was that the Great General Staff completely misunderstood the situation, and, believing the B.E.F. and French Sixth Army beaten out of the field, sent

the German Armies into a pocket between Verdun and Paris to be enveloped on both flanks, a disastrous position from which the only escape was retirement. By no argument can two very doubtful successes of the German western flank guard be exaggerated into even the germ of a victory.

Now, progressing through the war, a legend is being set going that the final failure of the Germans in October–November, 1914, to outflank the Allies on the Belgian coast, near Ypres, was due to the water of the sea being let in to stop their victorious advance. The great German film of the war, now on tour in the Fatherland, for the battles of the Yser and Ypres shows soldiers drowning in an inundation, with the following caption, and no more :—

> "Victory was almost within reach until the Belgians played a new card. The sluices at Nieuport were opened, and the battle-ground was flooded."

There is no hint that divisions of the Prussian Guard, the Brandenburg III Corps and other *troupes d'élite*, were beaten back after three weeks' fighting.

The same legend is being assiduously spread in books. In an official compilation of the Bavarian Military Records Office (*Kriegsarchiv*) just published under the title of "Männer! Ein Heldenbuch aus dem grossen Krieg." (Men! A hero book from the Great War.), which contains a collection of deeds of heroism in the war, one chapter begins as follows :—

> "With Germany's anthem on their lips, the young volunteer regiments had stormed in vain in October, 1914, against the Yser position. Only the war-experienced Brandenburg Reserve Corps had succeeded in breaking through the enemy front at one place and shaking the defence. Then the foe had called the sea to his aid and blown up the lockgates. The flood spread far and wide over the dry land, and foe and friend only saved themselves with difficulty from the waves."

It was on the night of the 28th October that the Belgian engineers succeeded in opening—not blowing up—the gates of the old Furnes lock at Nieuport and letting in the sea.[1] The inundation did not affect any of the new Reserve Corps (XXII, XXIII, XXVI and XXVII), containing 75 per cent. of war volunteers, which were attacking Dixmude and Ypres. It stopped only the III Reserve Corps (Brandenburg), one of the normal reserve formations organized in peace and filled with fully-trained reservists.[2] The serious fighting—when the German attacks failed—took place, as is notorious, after the 28th October, e.g., on the 31st October and 11th November. So another legend must go under.

There is no allusion to "gas" in the German film; few German histories mention it. Those that do attribute its first use to the Allies! The only means of combating such reiteration of legends seems to be the monotonous repetition of the truth :—that cloud gas was first employed by the Germans, and on the 22nd April, 1915, near Ypres.

What will the next legend be?

Yours, etc.,

E. A. D.

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[1] British Official History, 1914, Vol. II, p. 257.

[2] The map issued with the German official monograph "Ypern" (Ypres) shows that the advance of the northernmost of the new Reserve corps, the XXI, was clear of the inundated area.

GENERAL SERVICE NOTES

A COMBINED EXERCISE ON THE DORSET COAST.

(*Précis of reports by the Special Correspondent of "The Times," 18th and 19th October, 1927.*)

The G.O.C.-in-C., Southern Command, on 17th–18th October, held a combined exercise in conjunction with the Naval and Air Force authorities stationed within the boundaries of his command.

The most important feature of the exercise was to ascertain the probable influence of air forces upon combined operations that involve beach landings, such as those that were undertaken by the Japanese in Korea and Manchuria in 1894-5 and 1904-5, and near Kiao Chao in 1914, not to mention our own Gallipoli campaign of 1915 and the Zeebrugge operation of 1918.

The attackers, called the Blue Force, were supposed to come from a hostile base about 200 miles from the Dorsetshire coast, and were supposed to have an Air Force about equal to Red, similarly equipped, and a small civil aviation industry. Red had only a nucleus for an Air Force, obtained by subsidizing air transport lines. About four Red air squadrons were available. Blue possessed aircraft-carriers, and had inflicted a severe naval defeat upon Red. The Blues decided to land a division of their army and a battalion of tanks between Poole Harbour and Durlston Point. A Red Territorial Division, with headquarters at Blandford, was to prevent a hostile landing between Southampton Water and the Devon boundary. Red had no defended naval base nearer than Plymouth. Red submarines were conducting long-range patrols, the other Red craft inshore patrols, while Red aircraft conducted long-range reconnaissances by daylight. Obstructions and submarine mines had been laid off all likely landing places on the coast. Other defences had been organized for Portland Harbour. The Red troops had pushed forward detachments towards portions of the coast that were considered most dangerous so as to prevent any enemy landing between Poole Harbour and Durlston Point from advancing more than about three miles inland.

To return to the air problem. Red had one day-bomber squadron of D.H.9a machines, two fighter squadrons of "Grebes," and one Army co-operation squadron of Bristol fighters. These all started from land aerodromes, and were considered to have an advantage of about 300 per cent. over the aircraft of Fleet air arms. Blue (at sea) had six flights of single-seater fighters and four reconnaissance flights, besides a flight of flying boats and the fighter machines carried in the cruisers (2nd Blue Cruiser Squadron). On the Red side it was argued that a landing cannot be effected in face of determined air opposition; and, on the Blue side, that the establishment of a land aerodrome for Blue aircraft was of vital importance. The anti-aircraft ordnance of the Blue cruiser squadron and a flotilla of destroyers, however, was a factor to be taken into account in connection with the first statement.

On 9th October, Blue war vessels (two cruisers, four destroyers, and an aircraft carrier) raided Torquay and Teignmouth, while Blue aircraft attacked the Red aerodrome near Salisbury. On the 13th a similar Blue force showed itself in the Bristol Channel purposely, and Blue aircraft attacked Bristol aerodromes. On the 17th the Blue convoy put to sea in three bodies. The first (two cruisers, two destroyers, an aircraft carrier, and six transports) steered for the Bristol Channel as a feint, and altered course after dark to make further demonstrations in the West Country before joining the main force. This started an hour later. It included two cruisers, four destroyers, anti-submarine craft, and minesweepers, with all the remaining troop transports. During the hours of daylight, this large convoy was provided with an " air escort " (one aircraft-carrier with two destroyers in attendance). Between 3.30 and 4 in the afternoon, the Red Army and Air Headquarters at Blandford heard that the main Blue force had been located by aircraft at sea south of Start Point (between Plymouth and Dartmouth), without details being ascertained. At about 6 p.m. a report from a Red submarine located this Blue force and furnished sufficient information to give a general idea of the probable landing place. On the Red side, the troops were ordered to their positions.

On the 18th the sea was calm and conditions favourable for a beach landing. The plan of the Blue military commander was to land, in the first instance, a battalion of infantry and a section of tanks in Studland Bay to occupy Ballard Down, obviously the key of any covering position, and to land the remainder of the covering force, simultaneously and as speedily as possible, on the beach of Swanage Bay. It was calculated that, given favourable conditions of weather, thirty-nine aircraft of various natures from the Blue Fleet Air Arm would be in the air before daylight, and eighteen of these were allotted the mission of bombing the Red aerodrome at Old Sarum, whereas, as matters turned out, the Reds had received sufficient notice of the impending attack to cause them to move their aircraft to temporary landing grounds at Newton Heath and Grange Heath, situated respectively two and seven miles due west of Studland Bay. On the Blue side, the prospect of obtaining a landing ground for aircraft depended upon success in occupying Ballard Down, where suitable ground existed. In the preliminary arrangements on the Blue side the main features of the plan were—(1) the need to adapt the loads of the transports to the capacity of the merchant ships rather than to the tactical needs of the troops when landed ; (2) the use of submarines, showing lights, to give the true line of approach to the right beach to the convoy approaching the coast in the dark ; and (3) reliance upon tanks to help the infantry to occupy Ballard Down.

The covering force landed, in Studland Bay, three battalions of infantry, a brigade of field artillery, and a battery of light guns in Swanage Bay. The plan was based upon air photographs. Excellent as these were, they had their limitations, and Blue can hardly have realized from them the difficulties with which tanks would be confronted in finding exits from the beach, which in Swanage Bay is surrounded by a solid sea-wall, and in Studland Bay has only one practicable exit towards the objective, Ballard Down.

The Red military commander, it now appeared, had had sufficient warning of impending attack to place a battalion of infantry on Ballard Down, and another covering the Swanage Bay beach with rifle and machine-gun fire. Two concealed 18-pdr. anti-tank guns were covering the only exit from the Studland Bay beach, with orders to hold their fire until the craft landing tanks were within 500 yards, and two more, similarly concealed, covered the only exit from the Swanage beach ;

a battery of 4.5 in. howitzers had dug-in near Ballard Point, two more batteries of 18-pdrs. were in position on the " col " west of Ballard Down, and two battalions of infantry were in reserve near the same spot, ready to move east or south-east as required. Whether, under such conditions, any of the Blue covering force would have established itself on shore is a moot point. From the military point of view, the capture of Ballard Down did not seem feasible in face of such dispositions unless Blue was credited with superiority in the air and with overwhelming gunfire from the Blue cruisers. It seemed that more gunfire was needed from the sea on the Blue side to make the landing a practical proposition.

The exercise showed conclusively how careful preparation and cordial personal co-operation between all ranks of the three Services are needed before such a complicated operation as a beach landing can have any prospect of success. Two conditions are essential—secrecy and (when that can no longer be maintained) speed. The Red side had the advantage of early information. The Red aircraft started from landing grounds and made the aircraft carriers and transports their objective. This brought them under the close fire of the anti-aircraft ordnance of the warships, though in deciding upon the effectiveness of such fire umpires have little to guide them. To the Navy's old task of transporting the troops, landing them, and providing artillery fire from the sea is now added the task of providing anti-aircraft defence.

DENMARK.

A Bill was introduced and passed through the Folketing in the early part of this year, to authorize a plebiscite of the electors to be taken with a view to the conversion of the Army and Navy into a Guard Corps and a State Navy to protect Danish neutrality. The result of this policy would have been to reduce military expenditure to under a million sterling. But the proposal has now been rejected by the Lansting and the project may be regarded as shelved.

NETHERLANDS.

FUSION OF MINISTRIES OF WAR AND MARINE.—The idea of a single Ministry of Defence was first put forward in 1912, and at various times during the last nine years there has been one Minister in charge of both the Departments of War and Marine. In 1920, a Royal Decree was issued appointing a Minister of Defence, but parliamentary approval was required for the allocation of funds; a Bill was therefore introduced at once, but never came up for debate owing to the strong opposition.

In March last, M. Lambooy, the Minister of War and Acting Minister of Marine, requested the Second Chamber to consider his Bill as soon as possible. His main argument in favour of the Bill was that, even apart from the advantages which he saw in the amalgamation of the purely military work of the two Services, co-operation and unity of views and elaboration were urgently required for the modern demands of war in the economic and industrial fields. The proposal to separate the Home and East Indies Navies has been dropped, at least for the present, but the Minister points out that, whereas by the present Indian Constitution the Governor-General is the Commander-in-Chief of the Naval Forces in East Indian waters, yet he has no official relations with the Minister of War and Marine, but only with the Minister of the Colonies. He hints that some change will be necessary in this regard.

The Bill was passed by the Second Chamber on 10th June with a substantial majority.

The Minister declares that the personnel of the combined Ministry will be an undivided unity and claims to have found a solution of this problem. He is opposed to the appointment of Directors-General for the two sections and requires only an adviser to assist him in his organizing work, this adviser having no authority over either Army or Navy.

NAVY AND ARMY AIR SERVICES.—A committee, set up to advise the Government on the possibility of amalgamating the Air Services of the Navy and Army, has submitted their report.

They recommend the abolition of the Naval Air Service and the expansion of the Army Air Service, with the proviso that the Naval Air Service in the Netherlands East Indies shall be retained and made entirely independent of the Air Service in the Home Country and shall receive certain assistance from the Government.

It proposes that the number of pilots to be trained shall be increased by twelve per year.

UNITED STATES.

DEFENCE POLICY.—A recent report from Washington states that the President has expressed the view that he does not consider the unification of the Army and Navy under one head, as recently recommended by the "Dough Boys" Convention Meeting in Paris, is feasible. He does not appear to have expressed any opinion on the proposal put forward by the American Legion for an independent Air Force to be co-ordinated with the Army and Navy in a Defence Department.

The President is reported as being opposed to any naval building programme greater than that planned before the failure of the Geneva Limitation Conference.

NAVY NOTES

GREAT BRITAIN.

H.R.H. Prince George.

Lieutenant H.R.H. Prince George, K.G., G.C.V.O., was on 6th October, appointed to H.M.S. " Nelson," for duty on the Staff of the Commander-in-Chief, Atlantic Fleet, to date 21st October, the day on which this new battleship replaced the " Revenge " as flagship. Prince George's last ship was the " Hawkins," flagship on the China Station, which he left in November, 1926, after nearly two years in the Far East. From February to June, he studied in France, and qualified as an interpreter in French.

Flag List Changes.

Admiral Sir Henry Oliver, K.C.B., K.C.M.G., M.V.O., LL.D., hauled down his flag in the " Revenge " on completing three years as Commander-in-Chief, Atlantic Fleet, on 15th August, at Portsmouth. He was succeeded by Vice-Admiral the Hon. Sir Hubert Brand, K.C.B., K.C.M.G., K.C.V.O., formerly Second Sea Lord.

On 1st September, Rear-Admiral Henry E. Grace, C.B., hoisted his flag in the submarine " Oberon " at Gosport on assuming the duties of Rear-Admiral of Submarines, in succession to Rear-Admiral Vernon H. S. Haggard, C.B., C.M.G. The flag was transferred to H.M.S. " Dolphin " next day.

Rear-Admiral Henry R. Crooke, C.B., who had been Vice-President of the Ordnance Committee, Royal Arsenal, Woolwich, since 2nd January, 1924, was appointed President of the Committee, to date 10th October, in succession to Major-General B. R. Kirwan, C.B., C.M.G.

Rear-Admiral Bertram S. Thesiger, C.B., C.M.G., hoisted his flag in the " President " on 5th October, as Commander-in-Chief, East Indies Station, striking it at sunset, after which he was regarded as on leave of absence until he takes over the command from Vice-Admiral W. M. Ellerton, C.B., about 30th November.

Rear-Admiral Bernard St. G. Collard, C.B., D.S.O., hoisted his flag in H.M.S. " President " on 1st October, as Rear-Admiral in the First Battle Squadron, Mediterranean Station, and struck it at sunset, being then regarded as on leave of absence until he took over the command from Rear-Admiral D. T. Norris, C.B., C.M.G., about 1st November. Owing to the return of H.M.S. " Royal Sovereign " to Portsmouth to undergo a long refit, the flag of the Rear-Admiral, First Battle Squadron, was transferred to the " Royal Oak " on 26th August.

Rear-Admiral W. A. Howard Kelly, C.B., C.M.G., M.V.O., on 30th September took over the appointment of Naval Representative on the League of Nations' Permanent Advisory Committee, in succession to Vice-Admiral Aubrey C. H. Smith, C.B., M.V.O., who had held the post for four years.

The flag of Vice-Admiral Sir Rudolf W. Bentinck, K.C.M.G., C.B., Commander-in-Chief, Plymouth Station, was transferred from H.M.S. "Impregnable" to H.M.S. "Erebus" on 25th July, 1927. On this day, the "Erebus" was paid off and re-commissioned for service as cadet training ship and turret drillship, Devonport; and the duty of ship of the Senior Officer, Reserve Fleet, Devonport, which she also had performed, was undertaken by the cruiser "Carysfort."

PERSONNEL.

CANDIDATES FOR PARLIAMENT.—Under the Servants of the Crown (Parliamentary Candidature) Order, 1927, no officer or man is permitted to issue an address to electors or in any other manner publicly to announce himself as a candidate for election to Parliament. Officers desiring to retire or resign, and men desiring to be discharged or transferred to the Royal Fleet Reserve, with a view to standing as candidates, must make application through the usual Service channels. Approval of such applications will depend on the exigencies of the Service.

UNIFORM AMENDMENT.—The note to Dresses No. 9 and No. 10, on page 11 of the Uniform Regulations should read: "Officers landing in the evening, in uniform, on ordinary leave are to wear their dinner dress," the words "but not the white mess jacket" being omitted.

OFFICERS TO SPECIALIZE.—The following Lieutenants, R.N., have been selected to undergo the next long courses to specialize in the subjects mentioned:—

Gunnery.—G. R. Dolan, R. R. Airey, C. W. G. M. Woodhouse, R. P. Clarke, G. Bernard, P. H. E. Welby-Everard, R. L. Hoyle, F. A. Ballance, E. R. A. Smith, R. F. Elkins, R. B. Jennings, H. H. L. Dickson, S. H. Carlill, H. G. Dickinson, G. M. L. Fuller, A. R. Murray-Smith, D. L. Johnston, G. H. Oswald, J. F. W. Maitland, and S. W. Roskill.

Signals.—A. G. Rodger, B. de L. Faunce, D. O. Doble. J. Quicke, C. Leohnis, J. P. L. Reid, E. N. Haines, C. S. Bushe, J. D. Crossman, and H. St. A. Malleson.

Torpedo.—T. W. Botley, K. H. T. Peard, W. J. C. Robertson, A. B. R. Sands, S. A. Cooper, F. S. Walford, G. W. Harper, G. B. Sayer, L. H. T. Hollebone, C. W. C. Turner, L. Gowlland, R. J. H. Ryan, M. F. B. Ward, H. T. Powell, P. N. Churchill, C. J. Smith, E. R. Collins, J. F. Shepherd, T. F. S. Wilson, and R. D. Watson.

OGILVY MEDAL AWARD.—Lieutenant John Hughes-Hallett, of H.M.S. "Vernon," has been awarded the Ogilvy Gold Medal for the year 1927.

NEWMAN MEMORIAL PRIZE.—Lieutenant (E) T. J. Turner, of H.M.S. "Barham," has been awarded the Newman Memorial Prize for 1927-28.

GILBERT BLANE MEDAL.—Surgeon Lieutenant-Commander A. W. McRorie, M.B., has been awarded the Gilbert Blane Medal for the year 1927.

ADVANCED ENGINEERING COURSE.—The following have been given the qualification of (E†) on completing the advanced course in engineering at the Royal Naval College, Greenwich, in July last:—

Lieutenant (E) A. D. McGlashan; Engineer Lieutenant J. E. Cooke; Lieutenant (E) J. G. Maclean; Lieutenant (E) J. I. T. Green; and Lieutenant (E) J. F. S. Wilson. A prize of £20 has been awarded to Lieutenant (E) A. D. McGlashan, who obtained the highest marks in the final examination.

DARTMOUTH R.N. COLLEGE: NEW HEADMASTER.—Sir Cyril Ernest Ashford retired at the end of term in July from the post of Headmaster of the Royal Naval

College, Dartmouth, which he had held since the College was opened in 1905. For two years previous to that, he was Headmaster at Osborne College. Over 4,000 cadets have passed out of Dartmouth during his regime, including the Prince of Wales, the Duke of York, Prince George, and Prince Charles of Belgium. Sir Cyril retired on reaching the age of sixty.

He has been succeeded by Mr. E. W. E. Kempson, who from the staff of the Royal Naval College, Greenwich, in 1904, became a Naval Instructor, R.N., serving in China and the Home Fleet. He was appointed to Dartmouth College, and resigned his commission. In 1911, he became senior physics master at Rugby, but during the war served as a Major in the Royal Engineers, being awarded the M.C.

THE R.N. BENEVOLENT TRUST.—About half the profit of the Portsmouth Navy Week, £1,180, was handed over to the Royal Naval Benevolent Trust. The general principle on which grants were made from the profit was that the bulk of the proceeds should go to Service charities generally, and not to one Home Port in particular. The R.N. Benevolent Trust is also receiving £8,000 out of the £13,300 available as the half-share of the trading surplus of the naval branch of the Navy, Army and Air Force Institutes. The men of the lower deck were consulted as to the disposal of this surplus. Of the remaining £5,300, which is being divided between the various Commands, for disposal as may be decided locally, with the approval of the Commanders-in-Chief, the Nore will receive £650, Portsmouth £950, Plymouth £600, Port Edgar £150, Altantic Fleet £850, Mediterranean Fleet £1,600, East Indies, £250, Africa £100, and America and West Indies £150.

MATERIAL.

H.M. SHIPS "NELSON" AND "RODNEY."—On 15th August, the battleship "Nelson" was commissioned at Portsmouth with a full crew for service in the Atlantic Fleet, and after being docked during September joined the Fleet on 14th October, hoisting the flag of Vice-Admiral the Hon. Sir Hubert Brand, the Commander-in-Chief, on 21st October, in succession to the "Revenge." On 10th August the "Rodney" was commissioned at Birkenhead for trials with a special Devonport complement.

THE "KENT" CLASS.—The first of the new 10,000-ton cruisers, "Suffolk" and "Cornwall," were commissioned on 21st September and 3rd October respectively, at Portsmouth and Devonport, for further trials. The revised dates for their completion are mid-January, 1928, and the end of November, 1927, respectively. The "Berwick" (Fairfield Company) was commissioned at Devonport, with a special two-fifths complement, on 12th July and completed to full crew on 1st November to replace the "Despatch" in the Fifth Cruiser Squadron, China. The "Cumberland" (Vickers, Ltd.) began her trials in September, and is due for completion in November. The "Kent" (Chatham Dockyard) will not be finished until February, 1928.

LAUNCH OF H.M. SHIPS "LONDON" AND "DEVONSHIRE."—The "London," the first of the four ships in the second group of 10,000-ton cruisers, authorized in 1925, was launched on 14th September at Portsmouth, when the Lady Mayoress of London performed the naming ceremony. Her first keel-plate was laid on 23rd February, 1926. No details are yet available concerning the ship, but it is understood that the length is 590 ft., and that the armament will include eight 8-in. and twenty smaller guns, with eight torpedo tubes. The design has a high freeboard, lack of sheer forward, and absence of flare. The ship will be flush

decked, and carry two light masts without platforms or tops, the control and observation positions being arranged in the bridge structures. There is no side armour, but a 4-in. curved protective deck and the customary armoured shafts to protect the ammunition hoists. Parsons' geared turbines driving four screws, and supplied with steam from Yarrow oil-fired boilers, are designed to develop 90,000 S.H.P., giving a sea speed of from 31½ to 32 knots. The machinery is being manufactured by the Fairfield Shipbuilding and Engineering Co., Ltd.

The "Devonshire," laid down at Devonport on 16th March, 1926, was launched on Saturday, 22nd October, by Lady Mildmay of Flete. Messrs. Vickers, Ltd., are providing the machinery of this vessel.

H.M.S. "DORSETSHIRE" LAID DOWN.—The first keel-plate of H.M.S. "Dorsetshire," the first of the three cruisers of the 1926 programme, was laid at Portsmouth Dockyard on Wednesday, 21st September, on the slip from which the "London" was launched a week earlier. The ceremony of lowering the plate was performed by Mrs. Donaldson, wife of the Admiral-Superintendent.

NEW MINESWEEPERS.—On 17th September, contracts were announced with Messrs. Hawthorn Leslie and Co., of Hebburn-on-Tyne, for two minesweepers of a new design, provided for in the current Navy Estimates. These ships take the place of four motor launches which had originally been planned for 1926. They are of an experimental type, combining the merits of the old sloops and minesweepers in one.

RESERVE DESTROYER ORGANIZATION.—On 19th July, it was announced that between thirty and forty destroyers in reserve at the southern ports and at Port Edgar were to be sent to Rosyth and kept there in maintenance reserve.

The destroyer depot-ship "Greenwich" was to act as parent ship to them, and the total personnel required for her and for the destroyers would be about 500, all of them naval. A small additional party of civilians, about six in number, would be required for the operation of the floating dock. The nature of the work on which the personnel would be employed was similar to work in the Reserve Fleet, and would be the maintenance of the hull, machinery, and fittings of the ships in an efficient state of preservation. The economy expected was in the neighbourhood of £130,000 a year. The number of naval personnel which will be reduced is estimated at 174.

The "Greenwich," to which Captain L. G. E. Crabbe, D.S.O., was appointed as Captain (D), Reserve Fleet, Rosyth, left Portsmouth on 1st September, arriving at Rosyth on the 3rd. The first contingent of twelve destroyers arrived at Rosyth on 14th September, consisting of the "Sturdy," "Trojan," "Trinidad," "Trusty," "Turbulent," "Shark," "Steadfast," "Searcher," "Scimitar," "Seafire," "Serene" and "Scotsman."

EXERCISES AND CRUISES.

ATLANTIC FLEET TRAINING.—The ships of the Atlantic Fleet under Vice-Admiral the Hon. Sir Hubert Brand proceeded to the North-East coast of Scotland in September for their usual autumn practices. During the week ending 1st October representatives of the Press, as in 1926, were permitted to attend the exercises, which began with firing by individual ships at night. Day practices included searching for an enemy in thick weather, artificially produced by a smoke screen; and an action between two battle fleets at about 17,000 yards, in which the torpedo craft used smoke. The correspondents were much impressed by the value of the training given to the boys and young seamen in the ships of the Third Battle Squadron.

Admiral of the Fleet Lord Jellicoe was among those who witnessed the exercises, on board the " Hood," as the guest of Rear-Admiral F. C. Dreyer, his former Flag-Captain. He was greeted with a signal from the flagship " Revenge " which ran : " Atlantic Fleet extends to you a warm welcome and much appreciates the honour you are doing them by visiting the Fleet." Admiral Jellicoe replied : " Deeply appreciate your kind signal. It is a very great pleasure to join your fine Fleet."

MEDITERRANEAN CRUISES.—The Mediterranean Fleet under Admiral Sir Roger Keyes returned to Malta on 18th August from Argostoli, on the conclusion of the first part of its summer cruise. The Fleet left again on 2nd September for a number of independent visits, the places in the programme including Genoa, Athens, Naples, Rapallo, Aranci Bay, Leghorn, Ajaccio, Imbros, Famagusta, Haifa, Alexandretta, Larnaka, Limasol, Tripoli (Syria), and Alexandria. This cruise ended on 25th October.

SUBMARINE FLOTILLA'S VISIT TO JAPAN.—A cruise to Japanese ports was begun by the Fourth Submarine Flotilla, commanded by Captain J. B. Glencross, D.S.O., in the " Titania," in September. The " Titania," with " L " 2, 3, 20 and 27, was scheduled to visit Nagasaki, Karatsu, Miyajima and Kobe. The " Marazion," with " L " 7 and 8, was to vist Fusian, Misko, Kagoshima, Kobe and Nagasaki.

VISITS TO U.S. PORTS.—Concluding their summer cruise in Canadian waters and on the northern part of their Station, the " Calcutta," flagship of Vice-Admiral Sir Walter Cowan, and " Cairo," visited Boston, Massachusetts, from 10th to 14th October, and Washington, D.C., from 17th to 22nd October. The " Cairo " had previously visited Portland, Maine, from 5th to 9th October. Cruising independently, the " Capetown " paid a visit to New Bedford, Massachusetts, from 18th to 23rd October.

PACIFIC COAST CRUISE.—H.M.S. " Colombo," Captain A. M. Lecky, D.S.O., detached from the Eighth Cruiser Squadron, America and West Indies Station, made a cruise on the Pacific coast of Canada and the United States during the summer months. Her ports of call included Esquimalt, New Westminster, Seattle, Vancouver, Prince Rupert, Comox, San Francisco, Salina Cruz, and Cartagena (Columbia).

SOUTH AFRICAN SQUADRON'S CRUISES.—Between June and August, the cruisers " Birmingham," flagship of Vice-Admiral D. M. Anderson, C.B., C.M.G., M.V.O., and " Lowestoft," cruised up the East Coast of Africa, calling among other places at Lorenzo Marques, Beira and Mozambique. A cruise up the West Coast, lasting from 9th November to 14th January, 1928, is planned for these ships, during which they will touch at Walvis Bay, Lagos, St. Helena, Sierra Leone, Sekondi, Accra and Victoria.

FLEET AIR ARM.

AIR ARM SPECIALIZATION.—It was announced some time ago that attachment to the Fleet Air Arm does not render naval officers ineligible for selection later on to qualify as specialists. With reference to this order, the Admiralty state that it is desirable that any such officers who wish to be considered for a specialist course should forward their applications during the year preceding the completion of period " A," in order that they may be considered for the first course after they become available. Applications should be forwarded through the usual channels, accompanied by recommendations.

OBSERVERS SPECIALIZING IN SIGNALS.—A Fleet Order dated 26th August, provides that Naval Observer officers, on qualifying in (S), will receive payment of specialist allowances of 2s. 6d. a day in addition to Observer's allowance. Observers who are not qualified in (S) will be eligible for the payment of an allowance of 1s. a day when filling an appointment provided for under A.F.O. 633/27, subject to their being specially appointed.

OBSERVERS' ALLOWANCES.—Observers appointed to ships under construction prior to trials will receive a special allowance of 2s. 6d. a day, in lieu of Observer's allowance. This order has effect as from 12th April, 1927. The ordinary rate of Observer's allowance, after qualification, amounts to 6s. a day while holding an appointment, if qualified in wireless, or 4s. a day if not so qualified. While under training it amounts to 3s. for each actual day of ascent.

NAVAL CO-OPERATION IN SCHNEIDER CUP CONTEST.—The aircraft-carrier "Eagle," Captain B. M. Money, D.S.O., accompanied by the destroyers "Witch," "Wren," "Whitehall" and "Worcester," arrived at Venice on 12th September, to co-operate in the preparations and arrangements for the race for the Schneider Cup, which took place off the Lido, Venice, on Monday, 26th September. The "Eagle" conveyed from Malta certain of the seaplanes taking part in the contest. All five vessels left Venice on 28th September.

[*See also* AIR NOTES, *p.* 913.]

ROYAL NAVAL RESERVE.

OFFICERS' REUNION BANQUET.—Admiral of the Fleet Earl Jellicoe kindly consented to be present at the reunion banquet of the Royal Naval Reserve on 28th October. To give opportunity of meeting old shipmates, the rooms were open from 6.30 p.m., dinner being served at eight. Paymaster Commander H. B. Tuffill, R.N.R., again acted as Hon. Secretary.

REVISED REGULATIONS.—A revised edition of the "Royal Naval Reserve Regulations (Officers)," corrected to 1st July, 1927, is being issued to all concerned from the R.N. Store Depot, Royal Victoria Yard, Deptford. Old editions are obsolete.

CAP RIBBONS.—A Fleet Order dated 5th August, 1927, directed that while undergoing training in depots ashore, R.N.R. and R.N.V.R. ratings dressed as seamen are to wear cap ribbons lettered with the name of the Reserve to which they belong. These ribbons are included in the reserve kits. When embarked for training afloat they are to wear cap ribbons lettered with the name of the ship in which they are serving, one ribbon being issued gratuitously.

ROYAL NAVAL VOLUNTEER RESERVE.

BISLEY MEETING.—The London, Clyde, Sussex, Mersey, Tyne and Ulster Divisions, R.N.V.R., sent representatives to compete at Bisley in July, 1927. The following were the results of the R.N.V.R. Inter-Divisional Competitions:—

Inter-Divisional Rifle Competition.

1st. Tyne .. 364	2nd. London .. 337	3rd. Sussex .. 333
4th. Mersey .. 316	5th. Clyde .. 304	6th. Ulster .. 274

Inter-Divisional Revolver Competition.

1st. Tyne .. 121	2nd. London .. 110	3rd. Clyde .. 107
4th. Mersey .. 104	5th. Sussex .. 92	

The Prince of Wales's Prize.—The R.N.V.R. Bronze Medal was won by Ordinary Seaman H. Reed, of the Sussex Division, and he therefore entered for the Prize but was not successful.

Winner of "Graham" Cup (Individual shooting).—Lieutenant N. E. Morley, D.S.C., R.N.V.R., of the London Division with a score of 48.

CLYDE DIVISION.—The Clyde Division provided a Guard of Honour of approximately 250 ratings on the occasion of the visit to Glasgow of Their Majesties the King and Queen on 12th July.

Captain R. C. Primrose, V.D., R.N.V.R., the Commanding Officer of the Clyde Division and four other officers of the Division were presented to H.M. The King by the Rear-Admiral Commanding the Coast of Scotland at the Levee held at Holyrood Palace, Edinburgh, on the 15th July.

EAST SCOTTISH DIVISION.—On the 15th July the Scottish War Memorial at the Castle, Edinburgh, was opened by H.R.H. the Prince of Wales and inspected by H.M. The King. Commander J. M. Robertson, V.D., R.N.V.R., and Lieutenant J. M. Dick, R.N.V.R., were on guard in the Memorial Hall representing the R.N.V.R. Admiral Sir E. S. Alexander-Sinclair represented the Royal Navy and Field Marshal Earl Haig and other Field Marshals the Army.

TYNE DIVISION.—On the 28th July a dinner was held on board H.M.S. "Helicon" to the Captain and Wardroom Officers of H.M.S. "Nelson" by the Captain and Officers of the Tyne Division.

MERSEY DIVISION.—The Division mounted a Royal Guard at Merseyside Station on the arrival of H.M. The King on the occasion of the opening of the Gladstone Docks.

SUSSEX DIVISION.—Hastings No. 6 Sub-Division won the "Farquhar" Silver Bowl at the 12-pdr. Naval Field Gun Competition held on the South Saxon Ground, St. Leonards, on the 30th July. The "Farquhar" Bowl was presented by Sir Robert Farquhar, Bart., in 1908 for annual competition by the various Sub-Divisions comprising the Sussex Division, R.N.V.R.

ROYAL MARINES.

NEW ADJUTANT-GENERAL.—Lieutenant-General Lewis S. T. Halliday, V.C., C.B., succeeded General Sir Alexander R. H. Hutchison, K.C.B., C.M.G., D.S.O., as Adjutant-General, Royal Marines, on 1st October. On relinquishing his appointment, Sir Alexander addressed a farewell message to the Corps in which he expressed his appreciation of the loyal support given him by all ranks on all occasions, and of their readiness to carry out any duty which they had been called upon to perform.

RETIREMENTS, PROMOTIONS, ETC.—*Retirements.*—Colonel Second Commandant J. A. M. A. Clark, C.B., C.M.G., on account of age, to date 8th September, 1927. Lieutenant-Colonel N. F. Trotman at own request, to date 12th July, 1927. Lieutenant-Colonel H. N. H. Houghton at own request, to date 14th October, 1927.

Promotions.—Major and Brevet Lieutenant-Colonel W. W. Godfrey, C.M.G., to be Lieutenant-Colonel for distinguished service, to date 1st September, 1927.

GOOD SERVICE PENSION.—General Sir W. C. Nicholls, K.C.B. (Retired) has been awarded a Good Service Pension of £200 per annum in the vacancy created by the death of General T. W. Dowding (Retired).

GREENWICH HOSPITAL PENSION.—Major and Brevet Lieutenant-Colonel A. H. Hire (Retired) has been granted a Greenwich Hospital Pension of £65 per annum in the vacancy created by the death of Major (Hon. Lieutenant-Colonel) T. E. Hungerford (Retired).

PRIZE ESSAY.—A prize of £50 was offered by an Officer of the Royal Marines for a competition essay. The competition was limited to Captains and Lieutenants, Royal Marines, ashore and afloat (including Officers on the Seconded List).

A Committee consisting of Captain E. Altham, C.B., R.N., Editor of R.U.S.I. JOURNAL; Lieutenant-Colonel R. F. C. Foster, C.M.G., D.S.O., R.M., and Major A. G. B. Bourne, D.S.O., M.V.O., R.M., awarded the prize to Captain E. J. Woodington, R.M., H.M.S. "Barham," extracts from whose essay are published in this JOURNAL.

The essays forwarded by Lieutenant J. T. Hall, and Captain and Brevet Major R. A. D. Brooks, D.S.O., received honourable mention.

NEW KHAKI CLOTHING.—Approval has been given for the white tropical clothing (singlets and shorts) issued to non-commissioned officers and men, Royal Marines, serving on tropical stations, as part of their uniform, to be replaced by khaki clothing. Naval pattern singlets and white shorts already issued as tropical clothing are to be dyed khaki locally.

"PRIVATE PAGETT."—The bulldog mascot "Private Pagett" arrived safely in America and Major-General Commandant Lejeune, U.S. Marine Corps, in a letter to the Adjutant-General, Royal Marines, says: "It gives me great pleasure both officially and personally to report the arrival of the bulldog. He certainly is a wonderful specimen and has already won a warm spot in our hearts. "Private Pagett" will be paraded before the entire personnel of the Corps, therefore you can see he is destined for future travel both on land and sea. In conclusion I wish to say that the United States Marines express their sincere thanks for the new mascot and to add that we all consider it a most friendly act."

FOREIGN NAVIES.

ARGENTINE.

NEW CONSTRUCTION.—The two cruisers which are being built in Italy for the Argentine Navy will each displace 6,500 tons, with a length of 540 ft. and a beam of 59 ft. Their designed full speed is 32 knots. The main armament will be six 7.5-in. guns and six above-water torpedo tubes.

The three destroyers building by Messrs. J. S. White will be vessels of 1,520 tons; length 330 ft.; beam 31 ft. 9 in. with a maximum speed of 36 knots. Their armament will be five 4.7-in. and one 3-in. A.A. guns; two 21-in. triple torpedo tubes.

Three new submarines are, it is understood, to be built in France.

BRAZIL.

SCOUT CRUISERS OVERHAULED.—The Brazilian scout cruisers "Bahia" and "Rio Grande do Sul" have completed their trials, after being overhauled and provided with new machinery and boiler equipment. These vessels were built by Messrs. Armstrong Whitworth & Co., and launched in 1909. Although still in excellent condition, it was decided to take advantage of the many advances in marine propelling machinery since they were built, and the work was carried out

in the Rio de Janeiro shipyard of the Companhia Nacional de Navagacao Costeira; the new engine and boiler equipment having been supplied by Thornycrofts. The vessels have been converted to burn oil fuel, and the ten original boilers in each were replaced by six Thornycroft water-tube boilers, while the original five direct-coupled turbines were replaced by three geared turbines.

NEW SUBMARINE LAUNCHED.—The submarine "Humayta" building for Brazil at Spezia was launched on 11th June last.

CHILE.

REORGANIZATION.—The Chilean Navy is being reorganized with a view to increased efficiency. The Directorate-General has been abolished and the head of the Navy is now the Minister of Marine at Santiago. Under him there is an Inspector-General, whose duties are similar to those of our First Sea Lord; a Director of Personnel, similar to the Second Sea Lord; and a Director of Material, similar to the Controller. There is also a Chief of the Naval Staff, under the Inspector-General, with the rank of Rear-Admiral.

The fleet has been reorganized into two divisions, a cruiser division, which includes the battleship "Almirante Latorre," and a destroyer division.

NEW DESTROYERS.—The six large destroyers ordered in March last from Messrs. Thornycroft, as announced in the May JOURNAL, are understood to be of 1,320 tons, 35 knots speed, and to be armed with three 4.7-in. guns and two triple torpedo tubes. Their extreme length is 300 ft.; beam, 29 ft.; and draught, 9¼ ft.

FRANCE.

NAVAL ESTIMATES.—Although the 1928 Naval Estimates were circulated in May and the Naval and Finance Commissions of the Chamber recommended the adoption of the Bill in June, the Deputies dispersed on a three months' holiday without having voted the necessary credits for the 1927 portion of the Naval Construction Programme.

The Naval Commission, when reporting last year on the 1926 Bill for construction, stated that it was hoped to begin making up the six months' arrears and to start 1927 construction in April, 1927, and 1928 construction in January, 1928. As no authorization to lay down the ships can be given before November at the earliest, the programme will be still further in arrears.

NEW CONSTRUCTION.—The 10,000-ton cruiser "Duquesne" was commissioned for trials at Brest on the 1st August. She was due to commence her sea trials towards the end of September. This ship and her sister-ship, the "Tourville," are due for completion early next year.

The destroyer "Tornade" has completed acceptance trials.

The submarines "Sirène" and "Galatée" have completed a month's endurance cruise and joined the submarine "Escadrille."

AIRCRAFT CARRIER.—The new Aircraft Carrier "Béarn" has completed full power trials and is reported to have attained 20 knots with 40,000 horse-power. This appears to have been less than might have been expected, as her designed speed and horse-power were 21 and 39,000.

Aeroplanes from Palyvestre have practised landing and flying off from the ship with successful results.

EXERCISES.—The battleships and flotillas of the First Squadron carried out their torpedo firings in the early part of August prior to the summer leave period which commenced on the 15th of that month.

The competition for the Naval Cup was carried out by the First Squadron of seaplanes, off Cherbourg, at the beginning of August. The events included the bombing of the old submarine " Euler."

On the return journey of the First Squadron to Toulon from North Africa, combined exercises were carried out off Corsica. The broad purpose of the operations was to test the defences of the island and also to investigate the possibilities of Corsica as an offensive base, particularly for air operations. The exercise lasted four days and included surprise landings from the fleet.

GERMANY.

BATTLESHIPS OR 10,000-TON CRUISERS.—Alluding to articles which have appeared in the Press on the subject of replacement battleships, mention of which was made in these Notes for February, 1927, the *Kieler Zeitung* says that " any statements which may have appeared must be based on purely private conjecture and can have nothing to do with the plans of the Defence Ministry, although, of course, it would be fairly safe to assume that the preparation of designs for the construction of new battleships, which are so urgently needed to replace our existing obsolete ships, is engaging the attention of the authorities." It adds " For . . . details the English may still have to wait a long time—at least before anything is published by the official side."

LAUNCH OF THE " KARLSRUHE."—Cruiser " C," the " Karlsruhe," was launched at Kiel on 20th August, the ceremony being witnessed by some 20,000 people, and the occasion being widely advertised in the Press and by radio. She is the third ship of the name in the German Navy. The first " Karlsruhe " launched in 1912, was destroyed by an internal explosion on 4th November, 1914, with the loss of Captain Köhler and most of her crew. The widow of Captain Köhler performed the naming ceremony at the launch of the new ship. The second " Karlsruhe," built during the war, was scuttled by her crew with the rest of the German Fleet at Scapa Flow. The " Karlsruhe " and the " Konigsberg," launched on 26th March, 1927, will carry nine 6-in. guns, or one more than the " Emden."

TARGET SHIP.—The old battleship " Zähringen " is reported to have been taken in hand for preparation as a target ship ; the heavy armour is being removed from the casemates and gun turrets, and under water compartments filled with cork. Distantly controlled wireless will be fitted.

EXERCISES AND REVIEW.—President von Hindenburg attended the annual exercises of the German Fleet off Swinemünde in September, and held a review on the 14th of that month, when all German ships in commission, except those serving abroad, were present. The Fleet was commanded by Vice-Admiral Mommsen, son of the historian, and the President stayed on board the flagship " Schleswig-Holstein." This was stated to be the first occasion of a visit of the President of the German Republic to the Fleet.

CRUISE OF THE " EMDEN."—Continuing her world cruise, the new " Emden," the first cruiser of the post-war Fleet, visited Seattle in July. During her passage from the Dutch East Indies to Japan, the " Emden " is reported to have established a record in oceanic soundings, getting bottom at 33,795 ft.

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GREECE.

British Naval Mission's Report.—An Athens message to the Press of 13th September stated that Captain C. E. Turle, D.S.O., Head of the British Naval Mission to Greece, had submitted his report on the last exercises of the fleet to the Ministry of Marine. He is stated to have expressed his complete satisfaction with the progress made.

ITALY.

Launch of the "Trento." The cruiser "Trento," sister-ship to the "Trieste," launched on 24th October, 1926, was launched at Leghorn on 4th September, when Princess Giovanna named the vessel, and the King and Queen were present. These cruisers will be of 10,000 tons, 641 ft. long, with engines of 150,000 horse-power, the highest power yet given to a cruiser or any other war vessel, and the designed speed is 36 knots. The armament includes eight 8-in. sixteen 14-in., one 3-in. A.A., and six smaller guns; and four twin torpedo tubes.

Review off Ostia.—Signor Mussolini, in his capacity as Minister of Marine, held a review of the Italian Fleet off Ostia on 16th July. After the review, he proceeded on board the battleship "Cavour," where the Chief of the Naval Staff, other high officers, and ships' commanders were presented to him. He expressed his lively satisfaction at the superb spectacle of power and discipline which he witnessed, and declared that the Italian people were able to count on the Navy responding at any moment to the call of the King.

JAPAN.

Minelayer Explosion.—An explosion occurred on board the cruiser-minelayer "Tokiwa" during the summer manœuvres off Kyushu on 1st August, and five officers and thirty-three men were reported to have been killed. Three mines were stated to have exploded on deck while the officers were under instruction in mine-loading, and while the deck structures were riddled, the engine-room suffered no damage, and the vessel was able to return to Sasebo.

Admiral Kato Dead.—The death was announced from Tokio on 5th September of Admiral Baron Sadakichi Kato, who commanded the Japanese naval forces during the siege of Tsingtau. He was sixty-six years of age, and retired in 1922.

Naval Air Service.

The Naval Air Service is still in an experimental stage and the organization and standardization of machines is not yet complete. Air work with the fleet, though frequently practised, has been handicapped by the lack of suitable aircraft carriers and by the undeveloped state of aircraft wireless. There is very little co-operation between the Naval and Army Air Services.

Kite balloons are still in general use on board capital ships and cruisers.

Loss of Naval Airship "N.3."—See Airship Notes, page 918.

NETHERLANDS.

New Construction.—The destroyer "Kortenaer" was launched on the 28th June at Rotterdam.

The two C.M.B.s, of the 1927 Programme, were laid down by Thornycrofts at Hampton-on-Thames in June; they are 55 ft. long, with a designed speed of 35 knots.

A surveying vessel and a small ship to be employed for anti-opium smuggling duties, together with eighteen new aeroplanes are to be purchased for the Naval Air Service in the Dutch East Indies.

The gunboat " Mataram " and eighteen miscellaneous craft are to be converted into minelayers.

NORWAY.

REORGANIZATION.—Proposals for the reorganization of the Norwegian Navy have been formulated by the Defence Committee and are being submitted to the Storthing :—

Material.—The fleet to consist of—

Artillery Ships.
Destroyers.
Submarines.
Torpedo boats.
Minelayers.
Auxiliaries.
Naval Aircraft.

The artillery ship is visualized as being of about 3,200 tons, with a speed of 26 knots and an armament of six 5.9 guns and also torpedoes.

Destroyers are to be of about 1,000 tons displacement, 32 knots and armed with three 4.7 guns and 18-in. torpedoes.

It is proposed to modernize one of the existing warships, the work to include fitting new 5.9-in. guns and modern fire control apparatus.

Personnel.—The period for conscripts is to be nine consecutive months in peace time. It is recommended that petty officers should be abolished and command exercised only through the officers.

Four classes of cadets are to be entered at the Naval College instead of three, ten cadets to be admitted annually. The personnel is to be divided into the Naval and Artisan Corps. The Naval Corps will comprise deck duties, including gunnery, signalling, minelaying and torpedo work. The Artisan Corps will comprise engine-room duties, shipbuilding and aeroplane branches.

Naval Air Service.—There are to be four hydroplane stations, the existing ones at Horten, Kristiansand and Bergen, and an additional station in the north. It is proposed that ninety-six hydroplanes should be distributed amongst these stations.

SOVIET UNION.

BLACK SEA MANŒUVRES.—The Soviet Black Sea Fleet began its manœuvres on 15th September, and was visited by M. Rykoff, President of the Council of People's Commissaries. A most spectacular item for the week ending 24th September was a naval attack on Odessa, which began with an attempted landing of troops, an aircraft raid, and a gas attack. The Correspondent of the *Times* at Riga reported that the authorities had distributed great quantities of leaflets instructing the people how to act during a gas attack. He added : " The

almost incessant manœuvres in the Odessa region since the spring have kept alive rumours among citizens of all classes that a real war is coming, that the immediate enemy is Roumania, and that the cause is the Bessarabian question. Most of the prophets of the 'coming war' assembled at Odessa in order to superintend the sham attack on the town, among them Tukhatchevsky, the Chief of Staff; Muklevitch, the Commander-in-Chief of the Naval Forces; Orloff, the Commander of the Black Sea Fleet; and Dybenko, Director in Chief of Supplies . . . Muklevitch has issued a statement saying: 'The Red Fleet is master of the Black Sea, but its enemies are not asleep. Roumania is preparing her fleet, and even used the Bulgarian flag on 17th August to mask the destination of a 10,000-ton floating dock, which has reached her through the Dardanelles.'"

BALTIC OPERATIONS.—The summer manœuvres of the fleet in the Baltic were held in July. They included a sham attack near Kronstadt, in which all units were engaged, including submarines and aircraft. The manœuvres were attended by Voroshiloff, the War Commissar, and Muklevitch, with other high officials. Voroshiloff at a "midnight general meeting" of commanders and seamen of all units, was unanimously elected to be "Honorary Helmsman of the Red Fleet." He flew his flag in the "Marat." In a long speech to the personnel, he declared that the menace of war had become a reality, and that one would probably break out in 1928. The Fleet, already in good fighting trim, must constantly remember this, and must attain even greater efficiency for the trials 1928 might bring. An unofficial version added that Voroshiloff declared that the fleet would receive fresh units in 1928, beginning with four cruisers, three destroyers, and seven submarines, all of them to be at the disposal of the Baltic Fleet for the defence of Russian shores against British raids.

TURKEY.

NEW CONSTRUCTION.—The first of the two submarines building at Rotterdam has carried out very satisfactory speed trials, both on the surface and submerged.

The battle cruiser "Yavouz" (late Goeben) was successfully lifted on the 28th August after repairs had been carried out to the floating dock which collapsed at the first attempt.

UNITED STATES.

FLAGSHIP CHANGE.—The converted battleship "Texas," after being provided with tripod masts, anti-torpedo bulges, and additional armoured protection against air attack, hoisted the flag of Admiral Charles F. Hughes, Commander-in-Chief of the United States Fleet, on 1st September, in succession to the "Seattle," which was sent to the Navy Yard, New York, as receiving ship in place of the "Pueblo." The "Texas" sailed from New York on 5th September for the Canal Zone.

ADMINISTRATION CRITICISED.—In an article in the *Saturday Evening Post* of 24th September, Rear-Admiral T. P. Magruder, head of the Philadelphia Navy Yard, presented an indictment of the present naval administration in the United States. He declared that there had been failure to demobilize after the war, over-organization both afloat and ashore, that superfluous yards and bases on the Atlantic side were being kept going, and that obsolete ships, useless for war, were retained in commission in the Special Service Squadron. Rear-Admiral Magruder was requested by the Secretary of the Navy to submit a detailed plan of reform. On 26th October it was announced that he had been relieved of his command.

ARMY NOTES

HOME.

Regular Forces.

Appointments and Promotions.—The principal changes that have occurred during the past quarter are the following :—A.D.C.-General to The King : General Sir Philip W. Chetwode, Bart., K.C.B., K.C.M.G., D.S.O., Colonel, The Royal Scots Greys (2nd Dragoons), with effect from the 31st July, 1927, in succession to General Sir George F. Milne, G.C.B., G.C.M.G., D.S.O., LL.D., Colonel Commandant, Royal Artillery.

A.D.C. to the King : Lieutenant-Colonel G. G. E. Wylly, V.C., D.S.O., Indian Army, with the brevet rank of colonel, in succession to Colonel G. A. H. Beatty, C.B., C.S.I., C.M.G., D.S.O., Indian Army, who has been promoted to the rank of Major-General ; Colonel D. S. Branson, D.S.O., M.C., T.D., as Additional Aide-de-Camp to the King, in succession to Colonel (Honorary Brigadier-General) the Earl of Radnor, C.I.E., C.B.E., T.D.

H.M. The King has been graciously pleased to approve of the appointment of Her Royal Highness the Duchess of York to be Colonel-in-Chief of the King's Own Yorkshire Light Infantry.

Lieutenant-General Sir W. Gillman, K.C.B., K.C.M.G., D.S.O., has assumed the duties of Master-General of the Ordnance, in succession to General Sir J. F. Noel Birch, K.C.B., K.C.M.G., whose term of office expired on 30th September.

The following appointments are announced :—Major-General G. A. Weir, C.B., C.M.G., D.S.O., to be General Officer Commanding, Bombay District ; Major-General A. Solly-Flood, C.B., C.M.G., D.S.O., to be Commandant of the School of Equitation and Inspector of Cavalry in India ; Major-General G. H. B. Freeth, C.B., C.M.G., D.S.O., to be Deputy Adjutant-General in India in succession to Major-General A. Solly-Flood, C.B., C.M.G., D.S.O. ; Major-General C. E. Corkran, C.B., C.M.G., to be General Officer Commanding, London District, in succession to Major-General the Lord Ruthven, C.B., C.M.G., D.S.O. (on 1st February, 1928).

The undermentioned promotions are announced :—Major-General Sir Cecil F. Romer, K.C.B., C.B., C.M.G., to be Lieutenant-General ; Colonel C. P. Deedes, C.B., C.M.G., D.S.O., and Colonel E. T. Humphreys, C.B., C.M.G., D.S.O., to be Major-Generals.

Reorganization at the War Office.—On 12th September it was announced in the Press that a redistribution of duties at the War Office was about to take

place. The Master-General of the Ordnance, the Fourth Military Member of the Army Council, who has hitherto ruled over the Ordnance Factories, the Royal Artillery and the Royal Engineers (except as regards their personnel and training), through the Director of Artillery and the Director of Fortifications and Works, was to hand over to the Quartermaster-General the last-named Directorate, Fortifications and Works, (except as regards technical engineer and signal stores, together with the control of the R.E. and Signals Research and Inspection establishments). In exchange he was to receive the Directorate of Equipment and Ordnance. Further, the M.G.O. is made responsible for everything connected with military stores and clothing other than building stores, railway stores, sea transport stores and medical stores; in particular everything connected with mechanical transport, except vehicles on the establishment of the Royal Army Service Corps which remain under the Q.M.G. By thus receiving the charge of the Directorate of Fortifications and Works, the Q.M.G. is now made responsible not only for hiring accommodation, billeting and camping, but also for the construction of permanent barracks.

The real matter of importance in the whole alteration is that mechanical transport (track and semi-track vehicles, that is, tanks, tankettes, harties, dragons, etc., and motor vehicles), instead of being partly under the Q.M.G. and partly under the M.G.O., will, except for R.A.S.C. vehicles, be wholly in charge of the latter officer.

No clear explanation of the reasons for the change has been made public, but it is generally understood that the question first arose out of the problem that grew out of the imminent mechanization of the Royal Field Artillery and field units of the Royal Engineers. After due consideration it was thought advisable to place the task of carrying through the change wholly under the M.G.O., rather than divide the technical control of the equipment of these corps between the Q.M.G. and the M.G.O. Incidentally a little motor work, hitherto done by the R.A.S.C. will pass to the scientific corps.

The net result of the change really amounts to little more than the transfer of part of a certain class of work from one type of officer to another. But it seems as though the transaction may end in the M.G.O. being represented on every staff in the field as is the case with the Q.M.G. This possibility has given rise to some controversy in the Press and elsewhere. The outcome of the matter is not clear, but it would appear as though there existed solid objection to any scheme of augmenting staffs in the field rather than of simplifying them.

Meanwhile, as a result of the criticisms aroused by the change, its application was delayed from 1st October, the date of Lieutenant-General Sir Webb Gillman's taking over the office of M.G.O., until the 15th of that month. It seems, therefore, that the new order of things has now been initiated at the War Office. No statement has yet appeared as to any change outside the War Office.

Reconstitution of the Corps of Cavalry.—A Royal Warrant dated 12th July, 1927, provides for a reconstitution of the Cavalry into one corps for the purposes of the Army Act, the Reserve Forces Act, 1882, and the Territorial and Reserve Forces Act, 1907.

Units and personnel of the Corps of Dragoons, the Corps of Lancers and the Corps of Hussars are formed into a single Corps designated "Cavalry of the Line." The existing Corps of Dragoons, Lancers and Hussars are re-named Dragoons (Territorial Army), Lancers (Territorial Army) and Hussars (Territorial Army).

The new distribution is given in a Schedule appended to the new Warrant.

ADEN.—On the military control of Aden passing to the Imperial Government, the War Office assumed direct responsibility for the administration of the military forces forming that garrison on 1st October, 1927.

ARTILLERY COLLEGE.—This College is to be known in future as " The Military College of Science."

MECHANIST OFFICERS—ROYAL ARMY SERVICE CORPS.—A Quartermaster, Royal Army Service Corps, who has been commissioned for duty with the mechanical transport branch of that Corps will, in future, be styled " Mechanist Officer."

PARLIAMENTARY CANDIDATURES.—By a Royal Warrant dated 21st September, 1927, no officer or soldier of the Regular Army or of Queen Alexandra's Imperial Military Nursing Service " may issue and address to electors or in any other manner publicly announce himself or herself or allow himself or herself to be publicly announced as a candidate or a prospective candidate for election for any constituency to the Parliaments of the United Kingdom or Northern Ireland or the Irish Free State or the Senate or Legislative Assembly of Malta until he or she has retired, resigned or been discharged." The existing provisions of the Royal Warrant dated 12th March, 1926, are thus cancelled.

RETIREMENT OF ARMY OFFICERS.—The conditions of retirement from the Army have been amended by a provision to the effect that " an officer, if ordered abroad within twelve months of the date at which he would be eligible for voluntary retirement, may be excused from proceeding abroad on his undertaking to retire on the completion of the service entitling him to such voluntary retirement. The retirement of an officer ordered abroad who has already completed service rendering him eligible for voluntary retirement, and does not desire to proceed abroad, shall take effect from the date on which he would otherwise have been required to embark, or such subsequent date as the Army Council may decide."

COMMISSIONS IN THE ARMY. 300 CADETSHIPS OPEN FOR COMPETITION.—An examination of candidates for admission to the Royal Military Academy, Woolwich, and the Royal Military College, Sandhurst, with the view of making the Army their permanent profession, will begin on 15th November inst. There will then be open for competition not fewer than 305 cadetships—80 for the Royal Artillery, Royal Engineers and Royal Corps of Signals; and 225 for the Cavalry, Foot Guards, Infantry, Royal Tank Corps and Royal Army Service Corps of the British Service, and for the Indian Army. Candidates must have attained the age of eighteen and must not have attained the age of nineteen on 1st January, 1928.

SCHOLARSHIPS FOR SONS OF ARMY OFFICERS.—A limited number of boys may be nominated by the Army Council for admission to a competitive examination, to be held at Brighton College on 5th and 6th June, 1928, for one Gill Memorial Scholarship of the annual value of not less than £80, and several Gill Memorial Exhibitions of the annual value of £60. The total dues payable for a Gill Memorial Scholar amount to not more than £76 10s. a year. The Scholarship and the Exhibitions are each tenable for three years, and, on the recommendation of the Headmaster, the period may be extended to four years.

Candidates for nomination must be (1) under 14½ years of age on 1st June, 1928; and (2) sons of officers of the Regular Army (serving or retired) or, if such are not available, sons of officers of the Special Reserve or Territorial Army.

Applications (accompanied by Birth Certificates and Certificates of Conduct covering the two previous years), should reach the Under-Secretary of State, The War Office, London, S.W.1, not later than 1st April, 1928.

WAR MEDALS. OVER THIRTEEN MILLIONS DISTRIBUTED.—During the past twelve months 51,513 medals have been issued by the War Office. The total number issued since 1920 is 13,466,821, the details being as follows :—

1914 Stars	365,622
1914-15 Stars	2,078,183
British War Medals	5,670,174
Victory Medals	5,125,403
Territorial War Medals	33,440
Military Medals	130,241
Distinguished Conduct Medals	33,159
Meritorious Service Medals	29,499

Many medals yet remain to be distributed because the addresses of those entitled to them are unknown ; and applications for these medals should be made without delay to the Under-Secretary of State, the War Office, London, S.W.1.

THE KING'S MEDAL, 1927.—The Clasp " 1927 " for the champion shot of the Home Forces has been won by Warrant Officer W. Jagger, 2nd Bn. The King's Royal Rifle Corps. The medal was won by this warrant officer in 1925.

TERRITORIAL ARMY.

DIVINE SERVICE AT CAMP.—All officers and other ranks, when not prevented by military duty, will attend divine service at annual training in camp, but no officer or man will be obliged to attend the service of any religious body other than his own. They will be marched to and from their places of worship. The officer or non-commissioned officer in charge should, if possible, be of the same denomination as the members of the party concerned.

The duty of playing troops to church will not interfere with the attendance of a bandsman, drummer, bugler, or piper, at the regular service of his own denomination.

Commanding Officers will afford facilities for the attendance of officers and men at public worship, including celebrations of Holy Communion.

THE DOMINION FORCES.

ALLIANCES.—His Majesty the King has approved of the following alliances :—

Permanent Active Militia of Canada.—The Princess Louise Dragoon Guards to the 10th Royal Hussars (Prince of Wales's Own) ; The Royal 22nd Regiment to the Royal Welch Fusiliers.

Non-Permanent Active Militia of Canada.—The Calgary Regiment to The King's Own Royal Regiment (Lancaster).

Australian Military Forces.—The 43rd Battalion to the Oxfordshire and Buckinghamshire Light Infantry.

Union of South Africa Active Citizen Force.—The 5th Infantry (Kaffrarian Rifles) to the King's Royal Rifle Corps.

THE KING'S MEDAL, 1927.—The King's Medal with Clasp " 1927 " for the champion shots of the Military Forces in Australia and of Southern Rhodesia has been won by Warrant Officer, Class I, J. D. Shearim, Australian Instructional Corps, and Company Quartermaster-Serjeant F. H. Morgan, Southern Rhodesia Territorial Force, respectively.

NOTICES.

RETURN OF RESERVISTS FROM CHINA. AN APPEAL TO EMPLOYERS.—The men of Section " A " of the Army Reserve who were called up last January for service in China will return home between the middle of October and the end of November. These men, numbering some 1,650, responded promptly to the calling-up notices, although most of them were in civil employment at the time and many of them were married. Their conduct while with the Colours in China has been very favourably reported upon.

It is understood that many employers have agreed to reinstate those men who were previously in their employment; and the Secretary of State confidently hopes that this patriotic example will be followed by all the men's former employers.

Those men who have no employment to go to on their return home will be advised to register their names with the local representatives of the National Association for Employment of Regular Sailors, Soldiers and Airmen, and any employer who is desirous of offering employment to any individual should communicate with the local representative of the National Association, or with the Head Offices of the Association at 119, Victoria Street, Westminster, London, S.W.1.

MARCH, 1928, EXAMINATION FOR PROMOTION.

The following books, which are recommended for the study of the campaigns specified, can be obtained on loan from the Library of the Royal United Service Institution :—

Campaign.	*Books.*
Waterloo, 1815 (from the landing of Napoleon, March 1st to the conclusion of operations at Waterloo).	1. " Wellington's Campaigns, Peninsula-Waterloo, 1808-15." Part III. By Major-General C. W. Robinson. 2. " The Campaign of Waterloo." By Ropes. 3. " Napoleon and Waterloo." 2 Vols. By Captain A. F. Becke.
Campaign of the British Army in Mesopotamia, 1916-17, under General Maude from his accession to command to his death. Questions may be set on events leading up to the inception of the campaign and the general conditions under which the expeditionary force was despatched and re-inforced, also on the conditions of the country and climate as affecting operations.	1. " Mesopotamian Campaign, 1914-18." Vols. I and III. By Brigadier-General F. J. Moberley. 2. " Critical Study of the Campaign in Mesopotamia up to April, 1917." Compiled by Officers of the Staff College, Quetta. 3. " Outline of the Mesopotamian Campaign, 1914-18." By Lieut.-Colonel R. Evans.

FOREIGN

ABYSSINIA.

ABYSSINIAN DEVELOPMENT.—Abyssinia has continued slowly on her path to a place in the comity of nations.

The visit of the Duke of Abruzzi in May was the occasion of a display of the outward trappings of civilization somewhat mediaeval in character. The Duke was received by the Regent, Ras Taffari, in full state robes and a crown, and the streets were lined for miles by soldiers under chiefs in full costume. The objects

of the Italian visit were the promotion of friendly relations and the consequent increase of Italian influence in the country. The Italians hope to persuade the Regent to engage an Italian Military Mission. It is also desired that openings may be found for the employment of Italian experts in wireless, railways and other technical services. Another point considered was the possibility of establishing direct relations between the Abyssinian and Roman Churches. The general development of Abyssinia and the immunity of the country from foreign interference is a matter of special concern to Italy owing to her position in Eritrea.

In this connection, it may be mentioned that the United States Department of Commerce has issued an appeal for American capital to enter Abyssinia, "an almost virgin field for productive effort." Recently Ras Taffari suggested that American capitalists should employ the slaves, who still form a large part of the population, in the development of coffee, rubber and copper, paying the slave owners a yearly rental for each slave. Four years ago Ras Taffari promised the League of Nations that he would abolish slavery.—(*By permission of the Naval War Staff.*)

HOLLAND.

COMMUNISM IN THE DUTCH INDIES.—Fresh communistic outbreaks have taken place in the Dutch Indies, principally at Semarang. In Java, one sergeant, one corporal, ten privates and nine native civilians were arrested on charges of recruiting adherents to communism. Plans for a widespread communistic conspiracy was discovered and nipped in the bud. This activity had taken a firm hold in the Army. Energetic counter-measures were promptly taken.

POLAND.

TANKS.—According to the peace establishment for 1927 the Polish Army should possess between 200 and 220 tanks.

RIFLE ASSOCIATIONS.—The activity of the Rifle Associations has greatly increased. These Associations are composed entirely of true Poles. Their organization is on a strictly military basis. Their units are organized into higher formations on a strictly territorial basis. They are subdivided after a military model into platoons, companies and the like. There are a few mounted units, while the training of the departmental corps is carried out by military instructors lent for the purpose. It is said that the Associations are invited to participate in Army exercises and organize such training on their own account. Rifle practice is the principal form of training, but equitation, water sports and aviation are also encouraged. Women are also enrolled in these Associations for auxiliary war work and practice physical training, clerical duty and telephonic services.

RUMANIA.

ARMY ORGANIZATION.—The military budget for 1927 attained 6,000,000,000 lei in addition to 1,000,000,000 for extraordinary expenditure. This is equivalent to 21 per cent. of the national revenue. According to the new Law laid before Parliament, the period of active service amounts to two years, but in practice this is reduced to one year and four months. In the Navy, in the Gendarmerie, and in Frontier Corps the time of service remains three years. The privilege for a reduced one year's service has been limited and made dependent on the result of the examination for Reserve Officers' Commissions. The annual contingent is to be reduced to a maximum of 30,000 men.

The Averescu administration evolved a scheme, according to which the military re-organization of the country would be spread over ten years and cost 37,000,000,000 lei. Particular attention is to be paid to increase of aircraft, increase of tanks, improved training, construction of strategic railways and preparations for an industrial mobilization.

The strength of the officers' corps in September, 1927, was to be 12,300. Out of these there were 150 generals, 590 colonels, 660 lieutenant-colonels, 1,100 majors, 3,500 captains, 6,300 subalterns.

Communistic propaganda has of recent times increased in the Army, particularly in the old kingdom.—(*From the Militar-Wochenblatt No.* 10 *for* 1927.)

SOVIET RUSSIA.

Russian Views on Chemical Warfare.—During the Great War it was shown that Conventions were but scraps of paper, while chemistry grew to be a recognized weapon of warfare. It became not only a question of the employment of chemical resources but of arming defensively against them. The interest in the question is manifested not only in military circles but throughout the nation since it is exposed to the effects of chemical attack.

A visit to the Chemical Exhibition organized in Belgrade by the " Chemical Defence League " confirmed this belief. That exhibition was got up in order to point out to the population of Belgrade the modes of chemical attack and the manner of defence which the Serbian State proposes to employ. Other countries also possess such private organizations, since most European governments are afraid of dealing with the question in an open fashion. In America the matter is more frankly recognized, whilst in Soviet Russia it is publicly acknowledged. In Poland the " private " organization dealing with the case is, in fact, supported by the State. Germany is also preparing for it and concealing her designs, since she is doing so partly under protection of Soviet Russia, and partly under the pretext of the needs of agriculture.

Exhibitions of the same sort took place in America in 1923 and not long ago in Poland. It is, of course, necessary to prepare the country well to the rear of the fighting front, since panics might easily spread to the troops.

It is without question that the belligerents would now have recourse to the most brutal forms of warfare in order to gain the victory. Placards were put up (at Belgrade) stating that chemical air bombs might achieve the destruction of Agram in two hours, and that of Belgrade four hours, after a declaration of war. There was even a suggestion that every modern house should be provided with a chamber which could be rendered gas-proof in case of need.

Of the three sections of the exhibition, the first, devoted to the present development of chemical warfare, appeared of some interest. The whole section was arranged by Russians under the direction of Professor Zwett with the assistance of Colonel Dewel. The limited space did not permit of the entire exhibits being staged. By the side of the most familiar weapons, were shown the American floating smoke producers, tanks and aeroplanes fitted for smoke production. The smoke cloud generated by the latter, it was stated, would cover a city of the size of New York.

In addition to a sub-section dealing with protection against gas, mention must be made of the bibliography dealing with the subject wherein particular emphasis was laid on the Polish work by Lindemann entitled: " Chemical Weapons in Warfare."

The second section dealt with the chemical industry in Yugo-Slavia—where the experiments of the Serbian engineer, Popovich, dealing with the extraction of petrol, paraffin and lubricating oils from shale deserved special notice.

The third section showed the utility of chemistry and bacteriology in agriculture; this was arranged by the Russian Forestry inspector, Sukurenko.

Chemical warfare may occasion less deaths; but there exist no statistics showing the after effects of gas.

Chemical warfare will be followed by bacterial warfare. It is said that in Germany evidence has been obtained showing that a tube containing anthrax bacilli had been prepared for spreading an epidemic among horses that might be carried among human beings. There also exists the possibility of discovering "death-rays" wherewith to carry on physical warfare.

These new methods of war rest upon scientific knowledge, which will also yield the appropriate means of defence. Science must, therefore, be brought into the defence of States.—*From the Russkij Vojeimi Vjestnij for 5th June*, 1927.

[NOTE.—A few of the statements made in the above are somewhat questionable; but the general tenour of the article is of interest.—EDITOR.]

UNITED STATES.

MAINTENANCE OF TANKS.—After every exercise, tanks—more particularly heavy tanks—return in such a state that it may occupy several hours to clean them. It may even be impossible for the mechanics to inspect the tracks and the under-carriage until a prolonged cleaning has taken place. The interior of the tank may require almost as much care. The engines are only to be inspected after what may amount to a lengthy process of cleaning.

The 15th Tank Battalion, stationed at Fort Benning, Georgia, equipped with fifteen tanks, Mark VIII, had such an experience that it took several days to clean the machines. The Mark VIII tank is, of course, a large machine weighing over thirty tons, with a length of 35 feet and width of over 12 feet. It carries a crew of twelve men. The motor is a 300 h.p. 12-cylinder aero-engine of complicated design.

The question of cleaning the machines had given rise to much thought, until new sheds were built to accommodate the machines.

When these were constructed several special arrangements were made for the upkeep of the machines:—

(*a*) A special shop was arranged for the charging and care of accumulators; in this same shop there is an oxy-acetylene welding and cutting plant.

(*b*) A cleaning shed. Here there was installed an electric plant with an air-compressor; this is a similar machine to those employed in garages or in street repairs. From the compressed air tank a pipe is led through the whole range of the tank sheds, with a nozzle in each shed.

The cleaning of the inside of the tanks is carried out, particularly that of the interior, by means of petrol sprayed on the tank under air pressure. The petrol is retained and filtered for further use.

This, however effective in the case of oil and grease, is insufficient to remove hard-caked mud.

(*c*) It was, therefore, found necessary to instal a high pressure steam system which was installed in the same manner as the compressed air.

The boiler is heated by oil and air pressure; the air being obtained from the same source as in (*b*). Two burners are set under the boiler—one for raising steam rapidly, the other for slower and more economical heating when the installation is "standing by."

(*d*) Hot water. A further hot water system has been installed just (*b*) and (*c*) above.

This hot water is employed for filling the radiators of the tanks and thus obtaining a quick start in the coldest of weather. Should the supply of hot water not be required, the water can be employed in the ordinary way for any purpose.

In addition there have been installed:—

(1) A heated oil container holding over 120 gallons;
(2) A soda solution container for cleaning purposes;
(3) A sand-blast apparatus for the removal of paint;
(4) A petrol supply pipe whereby the tanks are fuelled by means of air pressure applied to the petrol system;
(5) A paint-spraying machine operated by the compressed air supply.

In this manner the tanks can be cleaned as follows:—The crew scrape off the heaviest, caked mud with spades. Then the machines are washed down with hot water or soda solution fed under air pressure. They are next sprayed with steam. If new painting is required, the old coat is then removed with the sand blast. As and when required the machine is cleaned by means of the petrol spray. They are then allowed to dry. Painting is then carried out according to requirements; with the help of the paint spray two men can, in three days, re-paint the whole fifteen tanks. This process is not only more satisfactory than brush-work, but it is also more economical of paint.

In conclusion, it should be stated that not only has there been a marked economy in time, and the company has gained much freedom for other duties.—(*Infantry Journal*, July, 1927.)

[The only question that remains is how far this labour-saving installation could be taken into the field.—EDITOR.]

AIR NOTES

ROYAL AIR FORCE

Personnel.

Appointments.—Group Captain M. G. Christie, C.M.G., D.S.O., M.C., appointed Air Attaché, Berlin, 23rd July, 1927. Air Commodore E. L. Gerrard, C.M.G., D.S.O., appointed Air Officer Commanding, No. 1 Air Defence Group vice Air Commodore J. G. Hearson, 1st September, 1927. Group Captain A. G. Board, C.M.G., D.S.O., appointed Chief Staff Officer, Headquarters, Middle East, 27th September, 1927.

Retirement.—Air Commodore J. G. Hearson, C.B., C.B.E., D.S.O., having relinquished his appointment as Air Officer Commanding the Special Reserve and Auxiliary Air Force Command, was placed on the Retired List, 1st September, 1927, at his own request.

Stores Branch.—Fifteen candidates have been offered permanent commissions in the Stores Branch of the Royal Air Force as a result of the competitive examination held in July last.

Accountant Branch.—A competitive examination was held in the middle of September for the entry of commissioned officers into the Stores Branch. It is hoped to make ten appointments as a result of this competition.

Flying Training.—During the period 1st July to 30th September of the current year the following have completed courses of instruction at Flying Training Units :—

Type of Course.	*Officers.*	*Airmen.*
C.F.S.	19	8
Ab Initio	36	26
Conversion	1	1
Refresher	7	1
	63	36

Royal Air Force Cadet College, Cranwell.—Eighteen Flight Cadets completed their courses of instruction at this unit and received permanent commissions in the Royal Air Force.

Technical Training of Aircraft Apprentices.—Four hundred and sixty-eight Aircraft Apprentices passed out from the School of Technical Training, Halton, and forty-seven from the Electrical and Wireless School, Flowerdown. Of these, four were awarded Cadetships at the Royal Air Force Cadet College, Cranwell.

SCHNEIDER TROPHY RACE

Flight-Lieutenant S. N. Webster on a Supermarine S.5 fitted with a Napier Lion geared racing engine won the race for the Schneider Trophy at Venice on 26th September. The winner maintained an average speed of 281.6 miles per hour.

NAVAL CO-OPERATION

FLEET AIR ARM AND COASTAL RECONNAISSANCE UNITS.

HOME WATERS.—Fleet Air Arm Flights in H.M.S. "Furious" took part in the autumn exercises of the Atlantic Fleet beginning in the early part of September. These took place in Northern Waters.

No. 480 Coastal Reconnaissance Flight at the beginning of July were exercised in the Irish Sea. Later in July, operations with submarines were carried out from the Cattewater and Portland.

During September a cruise was undertaken to a large number of seaside resorts round the shores of Great Britain. No less than forty different towns were visited.

The Flying Boat Development Flight, consisting of one "Southampton" and three experimental flying boats ("Iris," "Valkyrie" and "Singapore"), carried out an independent cruise in the Baltic, during August and September. The following ports were visited: Esbjerg, Oslo, Copenhagen, Puck, Danzig, Helsingfors, and Stockholm.

MEDITERRANEAN.—The Flights embarked in H.M.S. "Eagle" exercised with the Mediterranean Fleet until 18th August, when she returned to Malta for summer leave. H.M.S. "Eagle" embarked the aircraft for the Schneider Race at Malta and left there for Venice on 5th September, returning after the event.

No. 481 Coastal Reconnaissance Flight at Malta have co-operated with the naval and military units stationed at that port, and have carried out their normal routine of training exercises.

CHINA.—The aircraft embarked in H.M. Ships "Hermes," "Vindictive," "Argus" and "Enterprise" have been employed in connection with the general situation in Chinese Waters.

H.M.S. "Hermes" left China on 7th September for England for refit.

(*See also* NAVY NOTES, *p.* 894.)

OVERSEAS COMMANDS.

IRAQ.

During the period under review the situation in Iraq has remained very quiet, and no punitive operations have been necessary.

SULAIMANIA.—The situation at Penjvin has remained quiet since its occupation by Government forces, and in consequence the garrison has been reduced.

SHEIKH MAHMOUD.—Sheikh Mahmoud, after stating that he wished to act in accordance with the conditions of his submission as laid down by the Iraq Government, visited Baghdad and was interviewed with the High Commissioner on 6th July, in order to settle the details of his future. He has been forbidden by the Persian Government to settle in Persian territory and the question of allowing him to reside in Baghdad or Mosul is under consideration.

SOUTHERN IRAQ.—In view of the large number of claims arising from raids between Iraq and Nejd tribes, which would have to be examined by the Kuwait tribunal, and the length of time which would necessarily elapse before the claims could be settled, it is probable, should both parties agree, that all the claims may

be wiped out. This procedure was adopted by the conference which assembled recently at Ramadi to settle claims arising from raids between Iraq and Transjordan tribes.

TURCO-IRAQ FRONTIER.—The Commission appointed to deal with the demarcation of the Turco-Iraq boundary, which assembled at Zakho on the 26th March, has completed its work, the final pillar being placed on Dalamper Dagh on the Persian Border on 9th September.

PALESTINE AND TRANSJORDAN.

The refugee camp at Azrak has now been cleared and all Druzes have left Transjordan territory. The remainder of the force stationed at Azrak has been withdrawn, and all personnel have returned to their normal stations. Thus an episode, which in its early stages threatened to develop into an unsatisfactory and complicated situation, was successfully terminated. This success has been in no small measure due to the work of No. 14 (B) Squadron in carrying out reconnaissances to find the best roads for transport and to make certain that the ground ahead of the column was clear of a possible enemy, and also in keeping a close liaison between Azrak and Amman.

The whole of Azrakol Headquarters were transported from Amman to Azrak by air in one hour by Vickers Victorias of No. 216 (B) Squadron and the situation generally was controlled in a manner that was only made possible by the co-operation of aircraft. Frequent air reconnaissances of the district are being undertaken, in order to ensure that the Druzes remain outside Transjordan territory.

AVIATION IN FOREIGN COUNTRIES

FRANCE.

ESTIMATES, 1928.—The draft Estimates for air services for 1928 were published in July, but changes invariably occur before the sums are finally voted. The amounts are tabulated below, together with those actually voted for the current year, and the differences, which, it will be noted, are increases in every case, are shown in the last column.

	1928 *Estimates*. Francs.	*Voted* 1927. Francs.	*Difference*. Francs.
Military Air Service	844,878,860	747,755,190	97,123,670
Naval ,, ,, ...	251,597,500	99,749,900	151,847,600
Colonial Aviation	20,313,267	18,260,900	2,052,367
Civil Aviation	194,823,500	169,211,240	25,612,260
Grand Total	1,311,613,127	1,034,977,230	276,635,897

MILITARY AIR SERVICE.

Move of Unit.—The 12th Bombing Regiment, at present stationed at Neustadt will be withdrawn from the Rhine next year and will be stationed at Reims. In the meantime the strength of the Regiment will be reduced from twelve squadrons to seven, the five squadrons thus released being distributed among other Regiments, so that there will be no reduction in the strength of the Military Air Service.

Re-equipment.—Two squadrons of the 2nd Regiment (Single-seater Fighters) at Strasbourg, have been re-equipped with Bleriot-Spad 81.s, with 300 h.p. Hispano-Suiza engines.

This type is no improvement on the existing standard machine, the Nieuport 29, but is being used because there are a number of the Spad 81.s in the general reserve and it was considered desirable to exhaust the stocks before fighter squadrons are issued with newer types. A third squadron will shortly be re-equipped with this type, which has the same engine as the machine it has displaced.

LONG-DISTANCE FLIGHTS.—1927 has been an unlucky year for France in the matter of long-distance flights, except for one tour of the Mediterranean countries by Pelletier d'Oisy, in which he covered 6,500 miles in six days.

Several attempts on the long-distance record in the direction of Asia were unsuccessful, notably the Siberian flight by Coste and Rignot, and the Indian flight by d'Oisy.

In addition, French aviation suffered heavy losses in the failure of Saint Roman and Nungessor to reach America, the former across the South Atlantic, the latter over the North Atlantic. Traces have been found of Saint Roman's machine, but not of the other aircraft. Two machines have been standing by to make further attempts on the long-distance record.

GERMANY.

A big air display, at which over 100,000 people were present, was held at Tempelhof Aerodrome, Berlin, on the 11th September, in connection with the city's gymnastic and sports week.

In addition to the usual balloon and aerobatic events, during which one of the pilots crashed and broke a leg, there was a parade of some fourteen different types of training and commercial aircraft, demonstrating the stages through which a pilot passes before taking charge of passenger-carrying aircraft. A further interesting feature of the display was the formation flying, in which both light club aeroplanes and heavy three-engined commercial aircraft participated.

The chief attraction of the afternoon, glider towing, was a failure.

ITALY.

PUBLIC AEROPLANE FUND.—The Aero Club of Italy has set on foot a national movement with the object of stimulating the " airmindedness " of the country. Provinces, Towns, Factories, Societies, etc., are being encouraged to subscribe towards the cost of providing and presenting aircraft to the Regia Aeronautica. It has been definitely announced by Signor Mussolini that the subscriptions are to be " popular " and spontaneous, and that there must be no suspicion of pressure, direct or indirect.

The scheme is meeting with a certain amount of success, although up to the present only one aeroplane has actually been presented, others are being subscribed for by various institutions auch as The National Confederation of Farmers, The Turin Aero Club, The Railway and Harbour Militias, the employees of the Abattoir of Naples and of the " Fiat " works at Turin.

It was suggested that there should be a formal presentation of these aircraft to Il Duce on 4th November, this being the anniversary of the Italian Armistice.

FLIGHT ROUND ITALY.—In July last a remarkable flight was made by Captain Gelmetti of the Regia Aeronautica. He left Ciampino at 3.15 a.m. on a Service type single-seater fighter Fiat C.R.20 fitted with a 400 h.p. Fiat A 20 engine and, flying by way of Capua, Catania, Grottaglie, Loreto, Udine and Turin, landed again at Ciampino by 7.53 p.m. the same day.

In thirteen flying hours he covered a distance of 2,113 miles at an average speed of 149 m.p.h.

JAPAN.

AIR ROUTES.—The work of establishing aerodromes at Tokio, Osaka and Fukuoka, and landing marks at eight different places on the route, was due to commence at the beginning of August. In the next financial year, 1928-29, the following work is to be carried out :—

(1) Establishment of meteorological observatories on Mt. Hakone and Mt. Ibuki.
(2) Landing grounds for aircraft at five places, not including Tokio and Osaka.
(3) Air customs at Nagasaki and three other places.

AIR PILOTS.—The new aviation regulations having come into force on 1st June, the Aviation Bureau has granted the Senior Pilots' Certificates to twenty pilots. Out of ninety First Class Pilots, forty were selected and split up into two divisions. The first division, who have finished a week's training at Kasumigaura Naval Air Station, were given first Class Senior Pilot Certificates. The second division were to commence training on 7th June.

SOVIET RUSSIA.

COLLECTION OF MONEY FOR AIRCRAFT CONSTRUCTION.—It is reported in the Soviet Press that in order to raise funds for the expansion of the Soviet Air Fleet, an "Aviation Lottery" was launched by the Osoaviachim in December, 1926. Two million 50-kopeck tickets were issued, the prizes being flights. This lottery was apparently so successful that a second one was organized in July, 1927, with tickets to the value of 1,500,000 roubles (about £158,600).

It is also reported that a special tax has been imposed on all Russian trades unions for the creation of a "Trade Union Air Fleet." By means of this tax about £123,375 was collected in July and August, 1927.

SPECIAL FLIGHTS.—In July, 1927, a two-seater light aeroplane "A.I.R.," equipped with a 55 h.p. engine flew from Moscow to Sevastopol and back. The journey to Sevastopol was made via Kharkov, where a landing was made, the return journey being flown without a stop. The distance from Moscow to Sevastopol is about 800 miles, Kharkov being about half-way. Piontekovski, the pilot, took Jokovlieff, the designer, as passenger on the flight to Sevastopol, but carried out the non-stop return flight without a passenger, an additional petrol tank being fitted in place of the passenger. The "A.I.R." is a small biplane of apparently neat design.

On 20th August, 1927, the Russian pilot Shestakoff left Moscow, flying an "A.N.T.3" aeroplane, fitted with a 400 h.p. engine (probably an "M.5," the Russian copy of the "Liberty" engine), his announced destination being Vladivostok. The Russian monthly journal "Aviatsia i Chemia" announced that it was intended to beat the performances of Pelletier d'Oisy, Botved and Orlinski.

Shestakoff was reported to have arrived at Tachikawa (near Tokio) on 31st August, having apparently completed the flight Moscow-Tokio in twelve days. The "A.N.T.3" is built in Russia and appears to be copied, in certain details, from the aircraft of other nations.

On 7th September, 1927, the Russian pilot Shebanoff, flying an "A.N.T.3" fitted with a 450 h.p. Napier Lion engine, left Moscow on a flight round Europe. It was announced that he intended to proceed to Sweden, Denmark, Germany, France and Austria and that he would fly night and day. He was reported, two days later, to be at Venice, after which no further progress is recorded.

UNITED STATES.

FLIGHTS ACROSS THE PACIFIC.—On 13th July two American airmen commenced the first successful *civilian* flight from California to the Hawaii Islands, a distance of 2,350 miles across the Pacific, using a monoplane with a single Wright Whirlwind radial air-cooled engine. After flying for 25½ hours they were compelled to make a forced landing in the trees on the Island of Molokai, ninety-three miles short of Wheeler Field, Honolulu, which was their objective. Fog was encountered practically throughout the flight and shortage of petrol caused them to land.

The first Army flight from the West coast of the United States to Hawaii was accomplished on 28th June. Details of this flight were given in the last JOURNAL.

THE DOLE AIR DERBY.—Two prizes of £5,000 and £2,000 were offered by an American, Mr. James Dole, for the first and second pilots of aircraft to land in the Hawaiian Islands after a non-stop flight from the West coast of the United States. Eight pilots took part in the race which started from Oakland, California, on 16th August. Two aircraft crashed in taking off, two turned back. Of the four aircraft left in the race two went down in the Pacific with a loss of five lives: the remaining two completed the flight. In preparing for the race three airmen were killed while testing their machines.

YUGOSLAVIA.

BALKAN AIR RACE.—On the 27th-28th August, 1927, fourteen aeroplanes took part in an air race from Belgrade to Warsaw and back *via* Prague.

Of the fourteen machines, seven were Jugoslav, four Polish and three Czechoslovak.

Jugoslav.	5 Potez XXV	450 h.p. Lorraine engines.
	1 Breguet XIX	400 h.p. ,, engine.
	1 Fizir	260 h.p. Maybach ,,
Polish.	4 Breguet XIX	400 h.p. Lorraine ,,
Czechoslovak.	3 Types unknown.	

Only four machines finished the course, the winner being the Fizir piloted by Strijefski and Kojanko whose flying time for the distance of about 1,500 miles was 12 hours 22 minutes. The remaining three finished in the order they are given, their times being within 25 minutes of the winner. One Polish Breguet, one Jugoslav Breguet and one Potez XXV.

AIRSHIP NOTES

GREAT BRITAIN.

THE NEW AIRSHIPS.—Constructional work on the two new airships has progressed according to programme, and the assembly and erection of the hull structure of " R.100 " has reached an advanced stage. It is hoped that both airships will be flying in 1928.

DOMINION AIRSHIP PREPARATIONS.—The Airship Mission appointed by the Air Ministry to advise the various Dominion Governments on the selection of suitable sites for future airship bases has completed a vist to Australia and New Zealand. The Commonwealth Government and the Government of New Zealand have since decided to extend their meteorological services in the interests of future airship development. The acquisition of land in Western Australia on a selected site as a preliminary to the establishment of the first airship base has also been sanctioned by the Commonwealth Government.

STANDARDIZATION OF MOORING TOWERS.—At a conference held at the Air Ministry on the 11th August, 1927, at which the Airship Guarantee Company, the Zeppelin Airship Construction Company and the United States Military and Naval Attachés were represented, the standardization of mooring-towers was discussed. General agreement was expressed as to the desirability for some degree of standardization, and standard limits in respect of certain main features of the towers were also mutually agreed upon.

At the conclusion of the conference a visit was paid to the Royal Airship Works, Cardington, where the mooring-tower head, winches and equipment were closely inspected ; and the working of the winch controls and movable arm explained and demonstrated.

JAPAN.

LOSS OF AN AIRSHIP.—The semi-rigid naval airship " N.3 " was lost in a gale on 23rd October. " N.3 " had been taking part in the naval manœuvres and was on her way home when she ran into very bad weather with rain and thunder. Efforts to lighten the airship being without effect, the commanding officer endeavoured to descend on Kamitsu Island.

A safe landing was made and the craft tethered with improvised moorings, but the gale increased and the airship was blown out to sea when it blew up and disappeared.

The crew of seven jumped clear and were uninjured, save one petty officer who was hurt in falling on some rocks. Destroyers ordered out to the assistance of the airship had to return on account of the weather.

UNITED STATES.

ARMY AIR CORPS AIRSHIP " R.S.I."—A flight of 36½ hours duration was carried out by the semi-rigid Airship " R.S.I." This airship is the largest belonging to the U.S. Army Air Corps; it has a length of 282 ft., and carries nearly three-quarters of a million cubic feet of helium; the remaining aircraft of the military lighter-than-air branch are non-rigids.

The flight was commenced on 30th July from Lakehurst, New Jersey, and the ship proceeded to Scott Field, Belleville, Illinois *via* New York, Albany, Syracuse, Rochester and Buffalo, a distance of approximately 1,200 miles. It was intended to make four landings, but owing to adverse weather conditions only two were accomplished.

" LOS ANGELES " ENGINES.—The photograph of one of the engines of the U.S. Airship " Los Angeles " which appears in this number of the JOURNAL, opposite page 789, was presented by one of the designers of this machinery.

It shows a twelve-cylinder 420 Maybach engine, consisting of two banks of six cylinders. Each cylinder has one inlet and two exhaust valves; bore 140 mm.; stroke 180 mm. At normal full power the engine runs at 1,400 r.p.m. The crankshaft and camshaft are mounted in roller bearings.

The engine is reversible, i.e., no reversing gearing is required.

REVIEWS OF BOOKS

GENERAL.

My Working Life. By Colonel Lord Sydenham of Combe, G.C.B., G.C.S.I., G.C.M.G., G.C.I.E., G.B.E., F.M.S. (John Murray, London). 21s.

Lord Sydenham's career is indeed remarkable in its versatility. He began by passing first into and out of Woolwich, after which he spent thirty-three years on the active list of the Army. Five of these at Corps duty, nine as an instructor at Cooper's Hill, another nine in the Department of the Inspector of Fortifications, and seven as Superintendent of the Carriage Department at Woolwich. There were, besides, spells of active service in Egypt which, however, offered no chance of distinction; nevertheless in 1893 Major George Clarke was created K.C.M.G., while seven years later he was nominated Governor of Victoria.

This book shows clearly enough in a modest and unassuming manner that such success was fully merited by unique work first as Secretary of the Colonial Defence Committee which so truly laid the foundations of Imperial Defence. Clarke's strategical insight was acquired by laborious study. His work also bore fruit in another direction, for his treatise, "Fortification," became a classic, the truth of which was actually proved by the European War. In addition, he published not only numerous books on naval and strategical subjects, but also contributed regularly to the leading organs of the Press criticizing with entire freedom the views and actions of higher authorities; it was not surprising that Lord Wolseley in 1884 should have vetoed the one chance of a staff appointment that came his way. Yet with the statesmen with whom he came into contact, with the naval officers whose efforts to strengthen the Navy he so strenuously backed and with the editors for whom he laboured, Clarke had gained a reputation for foresight and for the grip of big ideas. His position was to be strengthened by his employment on the Hartington Commission of 1888 and on the Dawkins Reorganization Committee of 1901.

His recall by the Balfour Ministry from Australia in 1904 to serve as the only military member of the Esher Committee was not remarkable. Lord Sydenham's narrative of the proceedings of that Committee is not so piquant as the reference thereto in Sir Henry Wilson's diary. The Esher Committee is still quoted occasionally as though its divinely inspired utterances created a new military heaven at the War Office and even in Commands. As a matter of fact it made some mistakes in its recommendations and was somewhat indirectly autocratic in its procedure, when entrusted by the Government for a brief spell with executive functions. Yet on the whole it did big things for which the nation and Army owe it much. The chief credit for these things must clearly be given to the only soldier of the Triumvirate, Sir George Clarke.

From a soldier's point of view this was the climax of Sydenham's career, but the record of his subsequent work as Secretary of the C.I.D., of his governorship of Bombay, and of his attitude in the House of Lords and elsewhere concerning after-war controversies and problems afford interesting reading. He makes no secret that the angle from which he views such matters has considerably shifted since the time when, though a subordinate at the War Office, he spent ten days in openly supporting his old chief's, Sir Andrew Clarke's, candidature for Parliament. It may perhaps be counted a point in favour of the Army Reform of the present century that the serving soldier of to-day is somewhat more restricted as to speech and pen than his predecessors!

The Army and Sea Power. By Major R. B. Pargiter, R.A., and Major H. G. Eady, M.C., R.E. (Ernest Benn, Ltd.) 10s. 6d.

The authors have produced a useful little book of facts from British History to show the tasks undertaken by our Army to help the Navy in maintaining our sea power.

The safety and welfare of all parts of our Empire depend on the security of our oversea communications. Our Navy, however, cannot operate freely without a suitable network of maritime bases where ships can re-fuel and re-fit. Bases must be defended; hence the necessity of oversea garrisons. But in the first place these bases have had to be acquired,—if not by foresight and diplomacy, then by force of arms. Again, in war time it has been necessary to deprive an enemy of his bases. In both these operations the Army has played a most important part. The history of the British Army teems with incidents in which it has undertaken such operations conjointly with the Navy. And success has been due to wholehearted co-operation,—failure, to an evil spirit of competition. The co-operation of the air Service with the land and sea forces in the future has not been dealt with by the authors, but they wisely point out that air bases like sea bases will have to be protected by the Army which will thus have yet another commitment in the future.

Five Years in Turkey. By Liman von Sanders. (The United States Naval Institute, Annapolis). 1927. $3.50.

General Liman von Sanders' book was first published in 1920. A French translation appeared in 1923, but the present volume is the first English translation. The United States Naval Institute has done a service to military students by issuing this translation, for the book is a valuable contribution to the history of the campaigns in the East.

Liman von Sanders went to Turkey as head of the German military mission at the end of 1913, and remained there till the final collapse of her armies in 1918. He commanded the Turkish forces at Gallipoli in 1915 and on the Palestine front in 1918. He was an able, experienced and honest soldier, who served Turkey loyally and well in troublous times. But, quite clearly, he lacked the diplomatic skill which his extremely difficult position demanded. It was only natural that he should be unable to work in harmony with the tortuous and vain-glorious Enver, who believed himself a heaven-born strategist, and would tolerate no opposition to his schemes. But Liman von Sanders was also continually at loggerheads with the German officials at Constantinople and at variance with the Supreme Headquarters in Germany. Throughout his book we find constant complaints of intrigue and interference by the former and criticisms of the

un-informed decisions of the latter. Neither von Falkenhayn nor Ludendorff ever grasped the true conditions on the Turkish fronts. German Headquarters moreover seem often to have directed Turkish strategy with complete disregard of the views of their own Military Mission. Liman von Sanders was, for instance, apparently never even consulted, when the " Yilderim " adventure to recapture Baghdad under German auspices was initiated.

The most important part of the narrative, occupying more than one-third of the book, is the account of the final campaign in Palestine, when Liman von Sanders was in command of the defeated Turkish armies. Two articles summarizing this portion of the book have already appeared in this JOURNAL.[1] Chapter XVI of General Bowman-Manifold's " Outline of the Palestine Campaigns " also contains a detailed criticism of this account and points out some of the errors and exaggerations. The tendency of a defeated general to minimize his own strength and to magnify the numbers and advantages of the enemy is, however, only natural, and the book generally is simply and frankly written. The translation is literal rather than literary.

Pandour Trenck. By Oskar Teichman. (John Murray). 10s. 6d.

Baron Franciscus von der Trenck, known as Austrian or Pandour Trenck, was the famous leader of a light infantry corps which he raised from the Pandours, who inhabited the mountains of Hungary, for service in the Austrian wars against Frederick the Great. Carlyle describes him as " the greatest monster since the days of Attila." He was a man of remarkable personality. In height he was over six feet, very strong, a fine horseman, and a magnificent swordsman. His ungovernable temper often led him to " see red," but he knew no fear and was just the leader for the half-civilised and dare-devil crew who composed the Pandour corps. Whatever excesses they may have committed when out of control, under his leadership they were a most efficient body of irregulars for scouting and screening duties, as Frederick's generals found to their cost. Some of the feats performed by Trenck,—and by his men too,—are almost incredible.

Major Teichman's account of his life should be read, not only for the entertaining incidents of his lurid career ending in a sensational death at the age of thirty-nine, but for the light it throws on the work of the irregular corps during the first five years of the War of the Austrian Succession.

Command and Discipline. By Vice-Admiral W. Richmond, K.C.B. (Edward Stanford, Ltd., London). 5s.

Any book to which Admiral Richmond's name is appended will at once attract the attention of the student of war. It is a little disappointing, therefore, to find that the text of this small volume consists solely of quotations culled from various masters of war or from well-known historians of war. Short aphorisms of this nature—especially when these emanate from the XVIIIth century or the Napoleonic era—usually savour of pedantry and it is pleasant to turn to the longer, more modern and altogether more interesting extracts with which the collection concludes.

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[1] " The Turkish Operations in Palestine, September 19-23, 1918 " (August No. 1923) and " Marshal Liman von Sanders' account of the attack on his Headquarters at Nazareth, September 20, 1918 " (February No. 1924).

Valuable as the booklet may be, it only intensifies the belief that a treatise dealing with the psychological side of war is still badly wanted.

NAVAL.

Coronel and the Falklands. By John Irving. (A. M. Philpot, Ltd.). 6s. net.

" England can be crippled most effectively by cruiser warfare in the Atlantic." So ran the war orders to the German Atlantic Ocean cruisers. How it came about that these orders were not put into execution is explained by Mr. John Irving, in his " Coronel and the Falklands." The title of the book is, perhaps, misleading for the author deals thoroughly with the opening phases of the war upon the outer seas. He begins with the preliminary moves before the outbreak of the war and finishes with the destruction of the " Dresden " when the German flag was finally removed from the surface of the oceans.

The task set to the British Navy at the outset of the war is described in two sections. First, we follow the hunt in the Atlantic, by Admirals Craddock and Stoddart, for the " Dresden," " Karlsruhe " and the armed German liners. Then we turn to the Pacific and see how the China Seas became impossible for Admiral von Spee, upon Japan joining the Allies. After sending the " Emden " off to her raiding mission to the Indian Ocean, the German Admiral disappeared into the wide Pacific, not to be definitely located again until that tragic evening of 1st November, off Coronel.

After describing the world-wide net that was drawn around the German cruisers, the author deals with the telegrams which passed between the Admiralty and Admiral Craddock. In the light of after-events it becomes plain that at Headquarters the difficulties of the far distant Admiral were not fully appreciated and here we have set forth clearly, the sequence of events which led to the meeting between Craddock's slow and weak force and the " crack shooting, homogeneous and fast German squadron."

The tale of the disaster at Coronel, which is described with the aid of an excellent map, is compiled from both British and German accounts and contains all that will ever be known of the end of the gallant Craddock and of H.M. Ships " Good Hope " and " Monmouth." We see Admiral von Spee after the battle visiting Valparaiso, not flushed with victory, but apprehensive of the ever-tightening net that he knew was being drawn around his squadron. Mr. Irving describes how this net was tightened by Lord Fisher's immediate and masterly dispositions, which aimed at destroying the enemy with " overwhelming force."

The movements of von Spee and Sturdee are followed down to that dramatic moment on the morning of 8th December, when the Germans arrived off Port Stanley, and sighted the tripod masts of the British battle cruisers. Another well notated map aids the description of the battle which followed, in which the German squadron suffered the same fate that it had, only a bare six weeks before, meted out to Admiral Craddock.

The book is completed by a description of how, within eight months of the outbreak of war, the British Navy completed the first part of the task that was set to it in August, 1914. It is a book of peculiar interest at the present moment when the question of cruisers for the protection of trade routes is so much under discussion. The vast problem of the protection of our maritime trade is here illustrated by a lucid description of how the safety of the trade routes was secured in 1914, with cruisers that were all too few in number and lacked power and speed. Also the book has the great merit of being short and to the point.

The Italian Navy in the World War, 1915-1918. Published by the Historical Section of the Office of the Chief of Staff, R.I.N.

This is in effect a concise "Official History of the War—Italian Naval Operations." It gives in about sixty pages the development of Italy's naval forces and the principal actions and events in which they participated from the time she entered the war until the Armistice. This well-compiled and profusely illustrated little volume is devoted largely to the operations in and around the narrow waters of the Adriatic, where some of the work of the Italian Navy was as varied and adventurous as that in any theatre of hostilities. Her main fleet never met that of her immediate opponent, Austria, but both sides indulged in a policy of attrition. In this Italy showed considerable enterprise.

The whole account is almost severely official in its lack of any embroidery; it confines itself, as the sub-title states, to "Facts and Figures"; but in the two or three pages devoted to "special mentions" of individuals the reader cannot fail to be stimulated by gallant actions such as those of Captain Rizzo Luigi who, in command of two small motor launches, penetrated the closely guarded waters of Trieste and sank the enemy battleship "Wien" and who, with a similar force, drove through an escort of seven torpedo boats and sank the battleship "Szent Istran"; or, again, that of the two Raffaeles who swam into Pola, fixed a mine to the Austrian flagship "Viribus Unitis" and sank her.

Deeds, such as these, are worthy of a longer eulogy than they receive.

The student of war will note with interest the versatility which marks the sailor the world over. Here we find naval batteries and armoured trains ashore, the development by the Italian navy of railway and harbour works, a "naval regiment" at the land front, as well as a diversity of new and ingenious craft for use in his proper element to say nothing of the inauguration of the naval air service.

The difficulties which confronted Italy and the efforts of her naval leaders to assist the Allies are stated as dispassionately as their successes are modestly.

Seamarks and Landmarks. By Surgeon-Captain O. W. Andrews, C.B.E., R.N. (Ernest Benn, Ltd.). 18s.

In his "Leaves from his Log," under the above title, Surgeon-Captain Andrews takes his readers through some thirty years of service during which he put in much time upon foreign stations. We are told first of the Channel Fleet in the "Howe," in the days when the old "Admiral" class were in their prime, and then of the "Hecla's" commission in the Mediterranean when the "Levant Moppers" were an institution on that station. Then of Australia and a long commission in the "Ringdove" amongst the Pacific Islands in the course of which many out-of-the-way spots are described. After some years at Haslar, which are passed briefly over, the author went out to China and, falling ill, returned home through Japan and North America, to spend a further commission in the Mediterranean in the "Diana," most of the time being spent in the Levant. This is followed by a time in the "Magnificent," when Lord Charles Beresford commanded the Channel Squadron, and then back to the Mediterranean once more, in the "Bacchante," for a final commission before retiring in 1913. The war brought the author from his retirement, and he saw much active service, first on the Belgian Coast in the old "Revenge," and then in the "Prince George" through the Dardanelles campaign. Commenting upon the chapters dealing with Gallipoli, Sir John de Robeck says that they are "the simple tale of an officer who was present and saw

much." Surgeon-Captain Andrews completed the war afloat with two strenuous years in the North Sea in the "New Zealand."

Such is a brief sketch of a varied career, into which the author interpolates many stories of men he has met and of places he has seen. He hopes that his reminiscences will help to recall old times to his old friends and messmates, and so "lend fresh interest to a twice told tale." Undoubtedly they will do this and the book will interest all those who served in the Navy through the nineties until the end of the Great War.

MILITARY.

History of the Great War. Vol. III. Military Operations, France and Belgium, December, 1914 - May, 1915. Compiled by Brigadier-General J. E. Edmonds, C.B., C.M.G., and Captain G. C. Wynne. (Macmillan and Co.). 1927. 12s. 6d. Maps, 5s. 6d.

This third volume of the Official History covers the period from the end of the First Battle of Ypres in November, 1914, to the end of the Second Battle of Ypres in May, 1915. It is not a period of the war on which the British Army can look back with much pride. The old professional army was dead—its last intact units, formed into the 27th and 28th Divisions, were decimated in the mud of the Ypres Salient during the winter—and the new armies were not yet ready: heavy guns and munitions of all kinds were sadly lacking: and there was a distinct failure of tactical skill, a slowness to appreciate the conditions and necessities of trench warfare. As a consequence neither was the British Expeditionary Force's prestige high nor were its relations happy with its French allies.

The Territorial Force was largely called on to fill the gap between the virtual extinction of the old army and the appearance in the field of the new armies. Numbers of its units were incorporated into the regular divisions, and the first complete Territorial divisions arrived in France in the spring of 1915. About the same time came also the first of the Dominion contingents, the Canadians, soon to endure severe trial and to win fame at the Second Ypres. Thus began the deployment of the manhood of the Empire, of which the regular army had been so valiant a vanguard.

Now, too, began the efforts—spasmodic and un-co-ordinated at first—to produce munitions on a sufficient scale. The chapter on Munition Supply in this volume is excellent; the difficulties and hindrances are impartially stated, and the measures taken to build up an industry, which was eventually to be a main factor in the enemy's defeat, are clearly set forth. Little results could, however, be produced at once, and the battles of 1915 were fought under a terrible handicap of inferiority in guns and ammunition.

The first of the two principal battles of the period, Neuve Chapelle, may be said to have laid down the general lines on which attack and defence were to be conducted during three years of trench warfare. But never again till Cambrai in 1917 did a large-scale British attack achieve so complete a surprise. The advantage thus gained was not fully exploited, but the Germans deserve every credit for the quickness and skill with which they repaired the breach in their line.

The other battle, the Second Ypres, was remarkable for another surprise—also not fully exploited—the first use of gas in the war. Warning of the German preparations was received, but not heeded. Fortunately, however, the Germans themselves had not realised the effectiveness of their new weapon, and so let the

opportunity slip. The month's battle which followed was marked by a methodical, rather unenterprising, advance by stages on the part of the Germans, and by a series of hasty, uncombined, and ill-prepared counter-attacks by the British and, occasionally, by the French, in which the gallantry of the troops was more remarkable than the tactical skill of the commanders.

The volume maintains in every way the high standard of the two previous volumes produced by General Edmonds. It is admirable military history, lucid, frank, and very readable. General Edmonds' summing-up of a battle or a period is always illuminating and suggestive. The maps are very well done.

The Mechanization of War. By Victor Wallace Germains. (Sifton Praed & Co., Ltd.). 8s. 6d.

This work is mainly a denunciation of the tank, and of those authors who write in support of it. It is, of course, at all times a good thing to see both sides of the picture and Mr. Germains presents for us the ultra conservative view.

He commences by studying the effect of the tank in the Great War and arrives at the conclusion that the success of Cambrai, 28th November, 1917, and of 8th August, 1918, were mainly achieved by means of surprise and that the tank was merely a useful accessory to the infantry. The arguments which he produces are firstly that the Germans achieved greater successes without tanks, notably on 21st March, 1918. Mr. Germains states, on page 1, that the British Armies were very strongly posted that day, and on page 207 that the Fifth Army front was held by a handful of divisions: the latter is a more accurate description of the actual situation. Consequently the question of tanks does not come in; he might have added that our wire was very thin and even non-existent.

This factor of wire is not mentioned in connection with tanks, and yet it was the German wire which, up to 1917, prevented a surprise. Consequently it is not an unfair inference that it was the tank which made surprise possible—a not inconsiderable military achievement. The author quarrels with the war-time tank because it could not fight on two successive days. He offers the further objection that crews were gassed, but apparently imagines that 1927 finds us in the same position as 1918. The latest model of tank dealt with in this work is the Medium " D "—a post-war failure.

The radius of action of a Mark V tank was some twenty-five miles. To-day it is well over a hundred; gassing is a thing of the past; fire-power has improved greatly. May we then infer that the possibility of tanks bringing off surprise in the future will not be limited to their power to cross wire?

Again, Mr. Germains comments adversely on the tank because, in the war, tank casualties in machines were heavy and also, apparently, because on 8th August the casualties to the infantry were negligible! A good deal is said in this book about economists, and surely it is sound economy to save men rather than matériel.

The author urges the argument that tanks cannot act alone. This is one which has been made from the beginning by the so-called " tank enthusiasts," and one which the Chief of the Imperial General Staff stressed in his recent speech to the officers of the experimental Mechanized Force. The very existence of this Force shows the trend of military opinion in this respect. The Force consists of all arms except infantry and therefore tanks, nowadays, are no more acting alone than they were in the war.

Two chapters are included on tank design, but since the author takes H.M.S. " Royal Sovereign " as his model tank, the immediate problems of the tank designer are not dealt with.

In the chapters on the " elements of military power " the author urges the necessity of being able to raise large reserve armies of the man-power type : yet earlier in the chapter success in war is defined, apart from leadership, as a matter of

Speed ;
Smashing power ;
Staying power.

Staying power the infantry have and always will have if suitably armed against either infantry or tanks, but surely the machine-gun and wire, apart from other factors, have put an end to its speed and smashing power in a terrain suitable to armoured forces. Our spirits were, however, raised on reading the heading to Chapter XI which offers a solution to the problem of how we can escape from trench warfare. This, of course, is the beginning and the end of the armoured war idea, and yet we are told that the solution is the rapid mobilization of twelve divisions (which we cannot afford), followed by the creation of the National Army. A repetition of the last war in fact, as we had the best part of ten to twelve divisions in France by November, 1914 : and this because armoured forces have no " smashing power " !

Where the Cavalry Stands To-day. By Lieutenant-Colonel H. V. S. Charrington. (Hugh Rees, Ltd.).

Lieutenant-Colonel Charrington's modest little book of sixty pages provides a refreshing antidote to the writings of the Mechanize-Everything School. In a brief review one can only draw attention to the conclusions come to and advise all who try to keep an open mind to read at least Chapter III in which the conclusions are summed up. Briefly they are that cavalry still holds an essential position among the mobile portions of our national land forces, and that armoured fighting vehicles and cavalry are complementary,—the proportion being decided by the nature of the country. The use of cavalry in formations larger than a brigade will depend on the nature of the opposition rather than of the country. It will be found that formations such as a corps of two divisions of infantry will require a cavalry brigade for close reconnaissance purposes and that each division will want a cavalry regiment of three squadrons in addition to a machine-gun unit.

Great Captains Unveiled. By Captain B. H. Liddell Hart. (Blackwood & Sons, Ltd.) 12s. 6d.

Many will read with profit these short studies of certain military leaders of the past, the accounts of whose lives are not to be found in the ordinary man's library of military history and biographies.

They will appreciate the strategical ability with which Genghiz Khan, the founder of the Mongol Empire, in the thirteenth century advanced his armies into Turkestan, and with which after his death his great general Sabutai carried them into the heart of Europe. They will find that Marshal Saxe, the victor of Fontenoy, wrote much on the Art of War which was in strong contrast to the practice of his age and may be called deservedly a military prophet. They will learn from the study of Gustavus Adolphus that that great Protestant Captain introduced methods of discipline and organization, of fire-power and mobility which made his army the first in Europe—methods which when copied by Cromwell made the New Model Army equally famous. They will be interested in the curious career of Gustavus's great opponent, Wallenstein, whom the author dubs " the enigma of

history," and whose grand strategy he lauds. They will be reminded how Wolfe strove to educate himself in his profession and became an example to the British officers of his time in sympathizing with and caring for his men. They will learn all these things, but what Captain Liddell Hart wants to impress particularly on his readers is that each Captain became great in his time because he improved on his power to hit, power to move, and power to guard,—and that if we, in our time, want to improve on the practice of the day we must think only in terms of armoured fighting vehicles.

The Battle of Monmouth. By the late William S. Stryker, Adjutant-General of New Jersey. Edited by William Starr Myers, Ph.D. (Princeton: University Press, London, Milford). 21s. net.

This erudite and detailed study of the somewhat secondary action of Monmouth Court House, fought on 28th June, 1778, is a work for the student. By this attack the Americans attempted to cut off the important baggage train of Sir Henry Clinton, retreating from Pennsylvania towards New York. The author seems to be more interested in the questions arising out of the battle, than of the details of the actual fighting, which was substantially indecisive. Major-General Charles Lee, the American Commander, was subsequently court-martialled for his conduct of the action and found guilty of various minor charges. The real point lay in the assertions (not brought before the Court) that Lee, an ex-officer of the British Army, had, when previously taken prisoner by the British, acted treacherously towards his adopted country. The author throughout shows his conviction of Lee's complete guilt. It is, however, possible that Lee may have been more foolish, indiscreet and incompetent than a real traitor. The reader will judge for himself.

The Non-Commissioned Officer's Guide to Promotion in the Infantry. Volume I—Lance-Corporal to Corporal. 590 pp. Price 6s. 6d. net. Volume II—Corporal to Sergeant. 712 pp. Price 6s. 6d. net. By Major T. J. Edwards, late Somerset Light Infantry (Prince Albert's).

Two most useful books packed with information dealing with the whole field of the N.C.O's. duties from barrack-room to battlefield. There are questions and answers at the end of each chapter.

REGIMENTAL HISTORIES.

A Short History of the Royal Regiment of Artillery. By W. O. J. Loughlin, A.E.C. (Gale & Polden, Ltd., Aldershot). 1927. 1s. 6d.

A brightly written, informative and complete history of the Royal Artillery, compressed into 70 pages.

A History of the Royal Army Veterinary Corps, 1796-1919. By Major-General Sir Frederick Smith, K.C.M.G., C.B., formerly Director-General Army Veterinary Service. Published for "The Royal Army Veterinary Corps Officers' Fund." (Bailliàre, Tindall & Cox, London).

The chequered and interesting history of this Corps is well related in the present book. It deals principally with the early vicissitudes of the Farriers and Veterinary personnel of the Army down to 1914, and only summarizes the work

of the existing Corps during the Great War. This may, at first, seem strange, but it was perhaps the South African War that gave rise to the most important changes in that invaluable department.

The Oxfordshire Hussars in the Great War, 1914-1918. By Adrian Keith-Falconer. (John Murray, Albemarle Street, London, W.).

This history of this regiment, the first Territorial unit to embark for active service in the Great War, is a pleasing production of its type. It deals mostly with the early fighting in France and again with the Battle of Cambrai and the events of 1918. Maps and appendices are satisfactory.

The Yeomanry of Devon, 1794-1927. By Engineer-Commander Benson Freeman, R.N. Edited by Earl Fortescue, K.C.B. (The St. Catherine Press, London). 1927.

This regimental history is most attractive, not only by reason of its appearance but also because of its being compiled by such an authority on Yeomanry matters. The first half of the volume deals in an unusually interesting manner with the first century of this corps' existence; the latter part deals with the work of the Devon Yeomanry at Gallipoli, in Egypt, Palestine and France. The maps and photographs are admirable.

The History of the 7th Battalion, Middlesex Regiment. By Colonel E. J. King, C.M.G., F.S.A. With a Foreword by General Sir Ivor Maxse, K.C.B., C.V.O., D.S.O. (Harrison & Sons, Ltd., London).

A careful history of this Territorial Battalion from its origin during the Napoleonic Wars down to the present day. The earlier chapters deal in an interesting fashion with the formation and growth of the battalion. There is a good chapter on its participation in the South African War, while the latter half is devoted to the work of the battalion in Flanders.

The Essex Regiment, 2nd Battalion (56th) (Pompadours). By John William Burrows, F.S.A. (John H. Burrows & Sons, Ltd., Southend-on-Sea).

This volume is the second of a series dealing with all military units raised in the County of Essex.

It begins with the raising of the regiment in 1755 and in the course of eighty pages relates its history down to 1914. The remaining 100 pages deal in a clear manner with its activities in the Great War.

AIR.

The Beginnings of Organized Air Power. By J. M. Spaight (Longmans Green & Co., London). 17s. 6d.

Mr. J. M. Spaight presents a valuable historical analysis of the means employed by Britain in attaining that high degree of air power which she possessed at the end of the war. The various stages, Committee, Boards, Ministry, through which the British air administration passed on its way to that air power are unfolded

in detail with copious documentation. The air organizations of France, the United States and Germany during the same period are also described and the reader is able to make fair and extraordinarily illuminating comparison between the methods adopted by the different countries.

At the armistice Britain was stronger in the air than France, the United States or Germany. According to Mr. Spaight who, as an Assistant Secretary to the Air Ministry, presumably has access to reliable figures, she had 2,000 serviceable machines and 145,000 men more than the French air forces which came nearest to hers in size.

In support of this estimate of Britain's formidableness in the air, General von Hoeppner is quoted as saying that England and not France was the enemy whom Germany had to fear in the air. He speaks of the establishment of the Air Ministry, of the failure of the corresponding movement in Germany for the establishment of an Air Department and of the utter impossibility of coping with the British programme of construction which provided nearly 27,000 machines in the ten months of 1918.

Mr. Spaight suggests that the Fokker scourge was, to some extent, responsible for this country's awakening to the effectiveness of the aerial weapon and to the urgent need of reform in our air administration. He mentions the havoc wrought by the small, highly-controllable Fokkers among "lumbering sober-sides like our B.E's." In 1916 British aircraft constructors, responding to the impulse originated by the Fokker and passed on by the British public, had produced the D.H.2, the F.E.8 (both small rotary-engined "pusher" scouts) the F.E.2 B and the Sopwith "1½ strutter." These machines were able to give battle to the Fokker and frequently to overcome it. The Germans countered with the Albatross D. machines which, in their day, were excellent fighting aircraft and which caused heavy losses among the Allied air forces.

It was indeed our heavy losses in the spring of 1917 that "accelerated indirectly the second stage of the reorganization of the Air Service." The first step in that reorganization was taken in 1916 when the second Air Board, "really the first Air Ministry," was established. From that time until the Air Ministry itself came into being Mr. Spaight holds that matters improved and that British ascendancy in the air war was gradually won.

Mr. Spaight's work forms a carefully argued justification of the present administrative system. Whatever may be individual views upon the relative merits of the two-Service and three-Service systems most of those who have studied the subject believe that a return to the two-Service system is not now practical politics, no matter what political, staff, and administrative amalgamation may come about.

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OF THE

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VOL. LXXII.

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LONDON:
ROYAL UNITED SERVICE INSTITUTION,
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No. 66. OCTOBER 1927

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